APF ASIA PACIFIC FIRE MAGAZINE

REPORTING TO THE ASIA PACIFIC FIRE PROTECTION AND FIRE SERVICE INDUSTRY

MDM
PUBLISHING LTD
WORLDWIDE MEDIA

www.apfmag.com
Issue 56 • January 2016

Time for TFT to Trigger an IMPULSE...

The **Ultimatic Series** of Automatic Nozzles with a Flow Range of 40-500 lpm @ 7bar or 5bar

The **METRO 0 Series** of Fixed Gallonage Nozzles with Flow Choices of 75, 150, 230 or 380 lpm @ 7bar

The **METRO 1 Series** of Fixed Gallonage Nozzles with Flow Choices of 227 to 700 lpm at 7, 5 or 3bar

intersec

17 - 19 January 2016, Dubai

Stand No: 2-H24

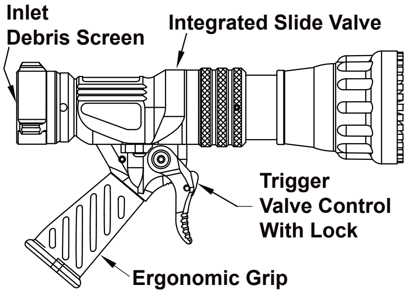
USA Pavilion

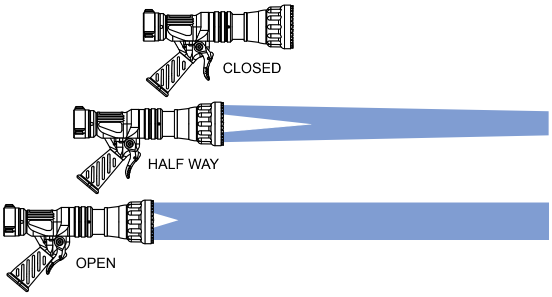
The **MidMatic Series** of Automatic Nozzles with a Flow Range of 260-760 lpm in 7, 5, or 3 bar

The **MidForce Series** of Dual Pressure Automatic Nozzles with a Flow Range of 260-760 lpm in 7, 5, or 3bar

IMPULSE™ TRIGGER VALVE SYSTEM

The innovative integration of a trigger actuator with TFT's globally recognized slide style of valve, provides complete nozzle operator flow control with only a single hand, allowing the other hand to consistently control stream pattern selection. The trigger controller operates smoothly and easily throughout the nozzle's rated flow and pressure range, and offers the ability to hold multiple valve positions at the operator's discretion. The unique ergonomic pistol grip compliments the trigger valve design and greatly reduces operator fatigue.





- Ergonomic Pistol Grip w/available color coding
- Trigger Valve Controller w/optional flow lock
- Integrated Slide Style Shut Off Valve
- Front Protective Bumper with Multiple Fog Tooth Designs

TFT®
TASK FORCE TIPS
FIRE FIGHTING EQUIPMENT

www.tft.com • 800 348-2686

Task Force Tips is a Worldwide Leader in the Design and Manufacture of High Performance Fire Fighting Equipment

TASK FORCE TIPS
FIRE FIGHTING EQUIPMENT

Wildland Fire

Nozzles, Valves and Shutoffs
Class A Foam Equipment

Handheld Nozzles

Fixed, Selectable Gallonage
and Automatic Nozzles
Low Pressure, Pulsing and
Compressed Air Foam Nozzles

Water Supply

Intake and Discharge Valves
Large Diameter Hose Hardware,
Appliances and Manifolds

Fire Apparatus Equipment

Manual and Remote Controlled
Deluge Monitors and Nozzles
Portable and Transportable Monitors
Pump Intake Valves, Manifolds
and Appliances

Industrial Fire

Fixed and Remote Controlled
Deluge Monitors and Nozzles
Foam Injection and Application Equipment
Large Diameter Hose Hardware,
Appliances and Valves

Firefighting Foam Equipment

Eductors, Aspiration Nozzle Attachments
Self-Educting Nozzles

www.tft.com
+1.219.548.4000
MADE IN U.S.A.
facebook.com/TaskForceTips

We are exhibiting **intersec 2016!**
Come and find us: Hall 3, Stand A24.

Reliable
TECHNOLOGY • QUALITY • SERVICE

The best products, using cutting edge technology, for nearly 100 years.

SPRINKLERS:

Storage, residential and commercial sprinklers. Available in different colours, different temperatures, different response rates, upright, sidewall, pendent and concealed.

VALVES:

Wet/Dry Alarm, Deluge, Pre-action or Check Valves. Regional trims, prepack and ready assembled. For low, ordinary or high risk occupancies.

SYSTEM COMPONENTS:

Varied range of system components to suit individual projects. Stocked at you local Reliable warehouse and delivered directly to your job site.

TAKE A LOOK:

View our full range of products by going to our website at: www.reliablesprinkler.com

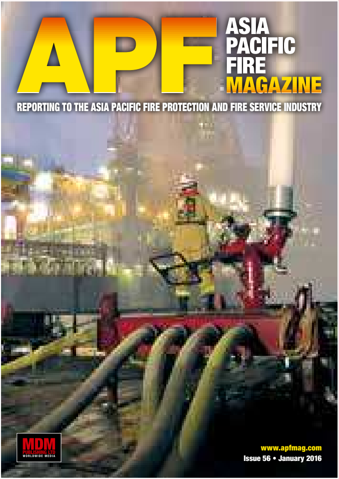
CONTACT:

Contact our team to see how we can help you.

United Kingdom Head Office:
+44 (0) 1342 316 800
rfsl@reliablesprinkler.com

Dubai office:
Tom Goodchild: +971 (0) 4 880 8830
tgoodchild@reliablesrpinkler.com

Reliable-Automatic-Sprinkler
RASCOUK
Reliable-Automatic-Sprinkler-Co-Inc


APF
ASIA PACIFIC FIRE MAGAZINE
REPORTING TO THE ASIA PACIFIC FIRE PROTECTION AND FIRE SERVICE INDUSTRY
MDM
www.apfmag.com
Issue 56 • January 2016

JANUARY 2016 • ISSUE 56

Cover image: WILLIAMS FIRE & HAZARD CONTROL has been credited with over 200 successful responses in land and marine-based incidents across the globe since 1980. Image courtesy of Tyco Fire Protection Products.

Publishers
Mark Seton
David Staddon

Editor
Neil Bibby ASFM, FAICD, MIFireE

Contributing Editors
Mike Creevey, Rishiraj Dutta, Ian Gabites, Mia Garlick, Mark L. Gribble, Joseph Keller, Valentina Koschatzky, Brenda Leahy, Vincent Lee, MaryAnne Leighton, Mark Lund, Marcy Lynn, Christina Magill, Wei-Kiang Ng, Mark Robertson, Chris Riley, Craig H. Shelley, Naaman Shibi, Sue Tarantino, Kirrilly Thompson, Scott Williams, Mike Willson, Matthew Wright.

Senior Design Manager
Richard Parsons
richard.parsons@mdmpublishing.com

Web and IT Manager
Neil Spinney
neil.spinney@mdmpublishing.com

APF is published quarterly by:
MDM Publishing Ltd
The Abbey Manor Business Centre,
The Abbey, Preston Road,
Yeovil, Somerset, BA20 2EN, UK.
Tel: +44 (0) 1935 426 428
Fax: +44 (0) 1935 426 926
Email: mark.seton@mdmpublishing.com
Website: www.mdmpublishing.com

©All rights reserved

ISSN – 1476-1386

DISCLAIMER: The views and opinions expressed in ASIA PACIFIC FIRE are not necessarily those of MDM Publishing Ltd. The magazine and publishers are in no way responsible or legally liable for any errors or anomalies made within the editorial by our authors. All articles are protected by copyright and written permission must be sought from the publishers for reprinting or any form of duplication of any of the magazines content. Any queries should be addressed in writing to the publishers.

Reprints of articles are available on request. Prices on application to the Publishers.

Designed, Edited and Printed in the UK.

***FREE* Subscription**
To subscribe to APF Magazine and for unlimited access to our digital resources, please register at www.apfmag.com

PROUD TO BE A MEMBER OF
CFPA-A

Contents

JANUARY 2016

REGULARS

5 Editors Comment
7 Industry Comment
8 News and Profiles

FEATURES

18 Fire Australia + Hazmat 2016
20 10 Tanker Air Carrier
23 Aspects of Foam need Careful Consideration – Part 1
30 The Art of Applied Fireproofing
35 What if a large Earthquake hit?
39 Taking the Heat out of Ship Fires
46 What does your Structural Firefighting Gear Protect you Against?
51 Risk to our Cities from Catastrophic Volcanic Eruption
54 Building Product Compliance – Get Ready for Positive Changes
58 Inspection App for Automating Fire Equipment Inspections
60 Petroleum Storage Tank Facilities – Part 2
65 Helping Hands, Hurting Hooves: Large Animal Rescue
71 A Fire Service Tradition
75 Pure Force Serving the Public Safety Needs of Philippines
79 Strengthening Early Warning Systems for Disasters
84 Include Social Media in Every Disaster Preparedness Kit
86 The Power of Debrief – From Chaos to Synchronicity

facebook. LinkedIn. twitter Google+

TouchControl

Fire Touchscreen. Remote Control Terminal. Active Maps.

Advanced
The Standard in Fire Systems

TouchControl is Advanced's new touchscreen remote control terminal & repeater. It delivers network monitoring and control as well as active maps and zone plans, all in a package that enhances any architectural environment and is easy to install and configure.

TouchControl includes all the control and indication options you'd expect from Advanced, all managed via its unique 10" HD interface. For the first time there's a fire system touchscreen that looks as good as it performs.

To book a demo or for more info visit touchcontrol.advancedco.com

Tel: +44 (0)1670 707 111 **Fax:** +44 (0)1670 707 222
Email: sales@advancedco.com **Web:** www.advancedco.com

Advanced
The Standard in Fire Systems

Embrace the Younger Generation

No matter what age you are there is always a younger generation behind you. Too often we don't think they are contributing as much as we did at their age. Let's start from the basic fact that children are born to replace us and in most cases they will one day; you will have retired and they will be running the country, town and/or fire station.

Neil Bibby
AFSM, FAICD, MIFireE
Editor

So let us figure out how we can give them the benefit of our experience, wisdom and knowledge and how we can also benefit in turn from their experience, wisdom and knowledge without falling into this traditional old mind set;

"The younger generation now live in luxury, they have bad manners, contempt for authority, they show disrespect for elders and love chatter in place of exercise" a quote incorrectly attributed to Plato in 300BC. But according to Cambridge professor Kenneth Freeman as far back as 1907 this was identified as being attributed to many notable people throughout the ages.

Those of you in the middle of your career will find there is always a younger and older generation. The forty year old Station Officer thinks that the thirty year old fire fighter has a lot to learn and that the sixty year old Superintendent is old school. Now imagine what the firefighter and superintendent are thinking?

There are two ways to face this issue, one is to leave it as it is and each generation has to learn the hard way or, alternatively acknowledge that you will be superseded and engage with those coming up behind you. Notice I didn't use the words assist, help, mentor or advise because all these processes are usually one way. However, listening and talking across different generations will see each benefit from the wisdom of the other.

This type of change in the culture of a rank-based organisation is not easy. As I said before, it has been going on for thousands of years and a small example of how hard it is exists in the promotional system within Emergency Services, that is, leadership roles are traditionally a function of age. I am not saying agencies don't promote on merit, but I'm saying that the systems mean that you will be old when you get to the top. You would have to say, looking at the EM incumbents that this is rife in the Asia Pacific region. The rank system with one step at a time and a healthy stay at each level 'to get experience', makes it difficult for young leaders to emerge. Also the inability of emergency services to flatten their rank structure results in this perpetuating into the future. I can count on the fingers of one hand the number of people that have jumped a rank and all of these have come from another agency and not been promoted from within. It may be worth looking over the fence into the commercial world where young leaders have a greater chance of stepping up to the plate.

Don't get me wrong, there are many excellent leaders in the so called older generation, I'm just saying we have systems in place that may be mean that we are not achieving the benefit of all available leaders in the pool.

There are a number of standout agencies that are looking at fast track programs and youth leadership initiatives that should be encouraged and copied. It is one of those things that should be showcased at industry conferences to get the message across.

Never forget the younger generation is the future and it is your role to make their climb easier.

Those of you in the middle of your career will find there is always a younger and older generation. The forty year old Station Officer thinks that the thirty year old fire fighter has a lot to learn and that the sixty year old Superintendent is old school.

Neil can be contacted at
neil.bibby@mdmpublishing.com
or via LinkedIn – Neil Bibby.

COLTRACO
Ultrasonics | since 1987

The Liquid Level of a functional CO2 cylinder

Know your cylinders are full

24 hours a day, 365 days a year

The Permalevel® Multiplex ensures fire suppression systems are always fully operational, 24 hours a day, 365 days a year. Capable of protecting hundreds of cylinders and with remote functionality, you can have peace of mind your critical assets are safe from anywhere in the world. Accuracy at 1/8”.

Works on all common fire suppression agents including: CO2, FM-200™, NOVEC™1230, old Halons such as 1301 and 1211, FE-13™, FE-25™, FE-36™, HFC-225 & 227.

intersec
17th - 19th January 2016
Dubai, UAE
Meet us at Stand # 6-B38

PERMALEVEL™ MULTIPLEX

46 Mount Street Mayfair London England
+44 207 629 8475 | coltraco.com

enquire via telephone or email sales@coltraco.co.uk

After Years of Complacency, Reform has Arrived

Despite years of denial from the building, construction and fire protection industries, and little interest in meaningful reform from governments, a recent wave of publicity surrounding non-conforming products and poor practices means all options are now on the table to solve the crisis of confidence around Australian building safety.

Scott Williams
FPA Australia CEO

Times certainly have changed. It wasn't so long ago the notion that governments would take up issues of non-compliant building products would have been laughable. And yet today we have multiple government inquiries into just that issue. Outcomes of these inquiries and other building and construction legislative reviews will send shockwaves through the building, construction and fire protection industries – and with good reason. As an industry we must now decide our own destiny, before governments decide it for us.

In Victoria, hundreds of buildings in Melbourne's CBD are being investigated for non-compliant cladding products at precisely the same time that a new Building Act is being drafted. Due to these high profile issues it is not facetious to imagine that the new Act may pave the way for state-based accreditation or licensing of building practitioners.

There is much internal rancour among the players in Victoria, with many unhappy with the performance of regulatory bodies and councils. The Victorian Coroner has been dragged into the fray, and the Ombudsman will no doubt soon be once again forced to investigate the regulation of the building industry. The gift of clairvoyance is not required to see that the Victorian building and construction industry will have more reviews and investigations in its future, but it is action that is needed, not investigation. The industry's flaws are plain to see and well-known to all involved.

New South Wales faces its own upheaval. The most recent review into the Building Professionals Act has recommended sweeping changes to the way individuals are recognised for their skills and competence. At the same time a Coronial Inquest into the Death of Pinkang (Connie) Zhang in the tragic Bankstown apartment fire of 2012 has echoed many of the sentiments of the Act Review as well as recommending changes to the Building Code of Australia (BCA) to require all apartments under 25 metres to have automatic fire sprinklers in residential areas: a reform long championed by FPA Australia.

At the federal level a Senate inquiry into non-conforming products will soon conclude and will likely recommend changes to the way building products are approved and sold in Australia. At the same time, a recent meeting of federal, state and territory building ministers voted to consider changing the way evidence of suitability is demonstrated in the BCA to better reflect the potential safety risk of products. The meeting also recommended the Australian Building Codes Board consider whether sprinklers on apartment balconies should be included in the Code.

FPA Australia advocates for meaningful fire safety reforms every day, however, as an industry and as an Association, we can only provide guidance to these political inquiries, reviews, investigations and committees. We cannot chart their course, nor can we perfectly predict their outcomes.

What we can do as an industry, indeed what we must do, is get prepared – because change is coming.

For example, it is certain that, in the future, all individuals working on lifesaving fire protection systems and equipment will require some form of accreditation. It is absurd that this is not already the case. In addition, it is certain that, at some time in the future, the nature of building design and approval will change so that only trained, competent and accredited individuals will be able to design, install, commission and certify important life safety measures in Australian buildings.

We can be certain of these changes, because the community already expects they are in place. The rolling media interest in the safety crisis in Australian buildings highlights community disbelief and dismay that these safeguards do not exist.

Too many people have either died tragically or come terrifyingly close to losing their lives as a result of poor practices in the building and construction industry; practices which have been shown to be out of step with community expectations. The media has rightly highlighted these concerns, politicians have become nervous, and now suddenly all options for reform are on the table.

We can only hope that whatever changes come will lead to better fire protection outcomes for the community. But, come what may, we can only guarantee our industry's future by ensuring our people are trained, competent and professional now. In the new built environment the most successful companies and individuals will be those that saw this writing on the wall early and responded, before their hands were forced.

For more information, go to www.fpaa.com.au

Head-to-toe Marine Firefighter PPE

Bristol's marine firefighter PPE, its Fleet Suit, has been expanded with the addition of compatible helmets, boots and gloves providing a comprehensive head-to-toe personal protection solution of marine firefighters. All garments in the range are certified to MarED standards.

Operating internationally, meeting the needs of marine firefighters requires specialised clothing which will protect firefighters at sea in a variety of situations but which focus primarily on offshore oil and gas exploration rigs and production platforms as well as shipboard fires arising from collisions and cargo fires and explosions. The principal features of marine firefighter PPE include the use of fabrics, garment structure and design which combine to protect against the hazards most associated with fires at sea. These hazards include a combination of proximity to heat and flame and prevailing, and unpredictable, weather conditions which often include driving rain, snow and ice, high winds and severe exposure to the elements.

Bristol's Fleet Suits have been supplied to many of the world's leading oil and gas exploration and production companies operating in offshore locations as different as the North Sea and North Atlantic to operations off West Africa, South America, Eastern Pacific and the Arabian Gulf. To meet the exacting standards demanded by operating companies, the PPE supplied is routinely required to meet the European Marine Equipment Directive 96/98/EC (MarED) as well as the relevant EN Standard with enhanced accreditation through Wheelmark Certification.

Fleet Suits to meet both EN469:2005 Levels 1 and 2 both include a yellow lightweight flame retardant outer layer. With a fleece lined high collar, plain cuffs and combination zip and velcro front fastenings, the coat is lightweight and ergonomically efficient allowing ease of movement in frequently difficult operating environments.

The comprehensive head-to-toe set of garments includes a helmet incorporating an integrated internal goggle visor and exterior visor manufactured to EN443 and EN14458. The rubber fire boot includes a safety toe cap and anti-perforation mid-sole and is manufactured to EN ISO 15090 Type 3. A new structural glove is a combination of a silicone coated Kevlar palm with a Nomex® back incorporating knuckle protectors married to a Goretex® moisture barrier and manufactured to meet EN659:2003 + A1:2008 + AC:2009.

For more information, go to www.bristoluniforms.com

Image courtesy of Bristol Uniforms

Harcor Rapidly Reducing Temperatures

Combat Firefighter heat stress with the only small, compact, low cost and portable Firefighter arm immersion cooling product on the market. Studies have found that forearm immersion in temperate water is more effective in lowering core body temperature than passive cooling, mist sprays or cooling vests. The patented Harcor Arm Cooler Harness has been designed and developed by Firefighters for Firefighters. The small and compact design of the Harcor Arm Cooler Harness means Firefighters can reduce their core body temperature almost anywhere, at a staging area, on the fire ground, in any urban or rural situation.

Forearm and hand submersion method proves to be the best. Numerous studies from around the world including Australia, Canada, US and the UK, show the significant advantage of arm cooling over ice packs, cooling vests, misting and other forms of passive cooling.

For more information, go to www.harcor.com.au

Image courtesy of Harcor

PERFORMANCE ADVANTAGE COMPANY

NEW!

Coil-Lok P/N #1021

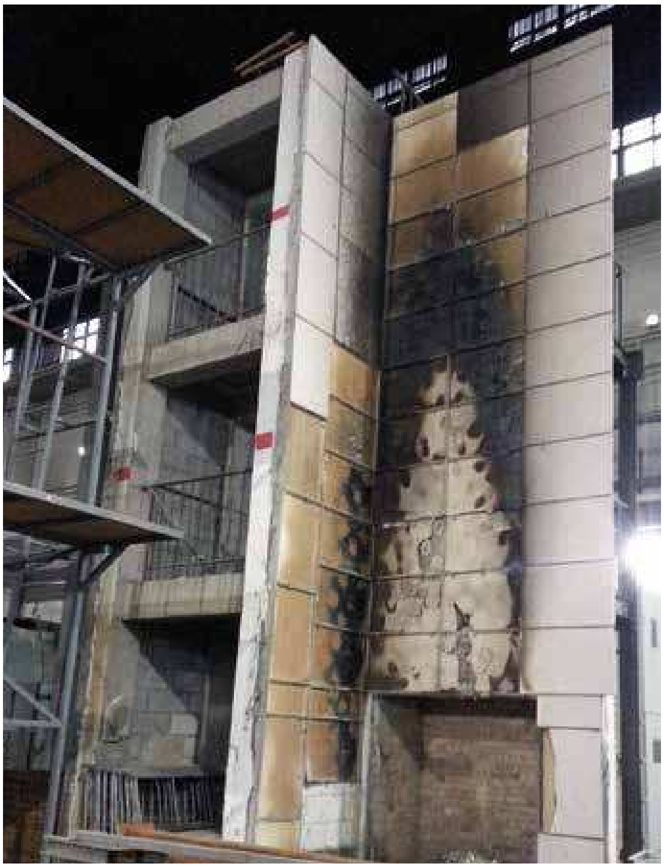
TOOL MOUNTING
PERFORMANCE ADVANTAGE COMPANY
PAC
SYSTEMS

- Extension Cords
- Hydraulic Hose
- Pike Poles
- Multiple "D" Handled Tools
- Chains
- Tow Lines
- Coiled Cables

For Pricing Or More Information Please Contact Us At:

Toll-free: 888-514-0083
www.pactoolmounts.com

CFPA-Asia October Meeting and Visits



Images courtesy of CFPA-Asia

Tianjin Fire Research Institute combustible facade testing rig.

The Confederation of Fire Protection Associations – Asia (CFPA-Asia) attended the China Fire 2015 the 16th International Fire Protection Equipment, Technology Conference and Exposition in Beijing in October. China Fire is the largest international fire protection exposition in China, and offered visitors and opportunity to attend a number of seminars as well a large indoor and outdoor exhibition.

The CFPA-Asia executive held their Executive committee meeting whilst in Beijing which was hosted by China Fire Protection Association.

The executive developed the 2016 activities, considered training and education arrangements and development of policy and position statements.

The validity period for the positions on Locking of Exit Doors, Maintenance of Fire Safety Systems and Single Station Smoke Alarms was extended until 1 December 2016

It was also agreed to develop guidelines for consideration at the May 2016 meeting on Practitioner accreditation and Combustible facades. The Sendai Framework for Disaster Risk Reduction 2015-2030 adopted at the Third UN World Conference in Sendai, Japan, on March 18, 2015 was discussed The Sendai Framework is the successor instrument to the Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters. This framework will be further considered at the next meeting in Melbourne Australia, in May 2016 as will promotion of International Earthquake Shakeout day.

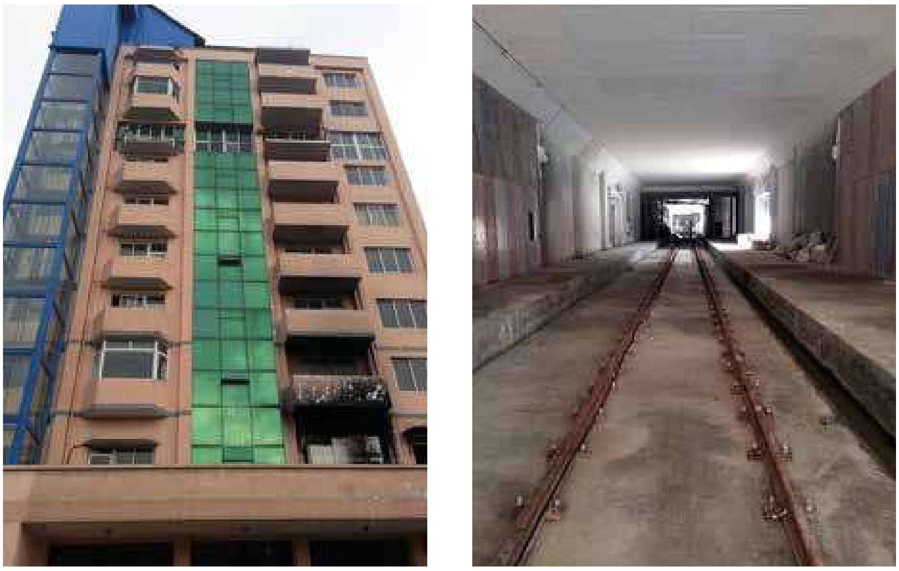
Some members also travelled to Tianjin Fire Research Institute and Sichuan Fire Research Institute.

At Tianjin, members met with Director Zhang Qinglin and staff of the institute including Deputy Directors Han Weiping and Zhangshao Yu and Vice president Zhang Shaoyu who also represents China Fire Protection Association with CFPA-Asia. The Tianjin visit provided an opportunity to discuss passive fire testing and work being carried out on combustible face cladding.

In Chengdu, members met with Director Li Feng and other senior staff including Lu Guojian, Janjun Liu, Zhang Zejiang and Xin-Guo Ge. Again there was much interest in work on combustible facades but also high rise building fire testing, railway carriage and underground tunnel fires and fire resistant boards. A visit was also made fire research and testing centre in Dujiangyan City, 40km away from the headquarters in Chengdu.

Resulting from both visits, CFPA-Asia will develop a co-operation agreement with Tianjin Fire Research Institute and Sichuan Fire Research Institute to the benefit all member countries.

Sichuan Fire Research Institute High-rise fire test building and newly developed railway tunnel test facility.



For more information, go to www.cfpaa.com

Tait Radio Academy Announces New P25 Standards Course

Tait Communications' online education program, the Tait Radio Academy, has launched a new course covering the P25 suite of standards for digital radio communications. The new course is part of Tait's ongoing commitment to critical communications technology users to provide education, skills and knowledge in this important interoperability standard for public safety organizations.

Tait Radio Academy launched earlier this year to address the growing need for accessible training content. Recognizing that more and more people would rather watch videos than read a manual, the Radio Academy has published dozens of videos around topics including wavelength, trunking, and coverage.

The new P25 course will consist of 17 videos on the Radio Academy website covering a wide range of technical topics, including network architecture, channel operation and configuration, and call types and features.

Craig Clapper, President, Global Solutions and Business Development at Tait Communications, said the new P25 course has arrived at the right time.

"We've seen high interest and adoption rates from our customers for P25 around the world, particularly at public safety organizations in North America, Australia and New Zealand. Our course was developed in response to ensure the next generation of radio technicians has the skills and knowledge needed to effectively use P25 to enhance their communication. I'm pleased that our experts can share their knowledge in this way and help build skills in radio technology. We've had a terrific response to the Radio Academy since it launched, and I expect we'll see the same with our P25 course."

Experts with decades of industry experience in education and radio technology write each of the Tait Radio Academy courses. Courses are free and video lessons can be viewed online. Registration gives users additional access to study tools, including a guide, quizzes and certificates, and collaborative learning through online forums.

Tait Communications' educational resources also include the bi-annual Connection Magazine and P25 Best Practice guides.

For more information, go to www.taitradioacademy.com

Image courtesy of Tait Radio

The Problem: False Alarms

The Solution: CTI™ Series from Protectowire

Protectowire's CTI Linear Heat Detectors use patented multi-criteria detection technology for the highest immunity to false alarms.

CTI Detectors provide digital operation with short circuit fault identification and confirms the temperature at the alarm point to provide true Confirmed Temperature Initiation (CTI).

See the next great advance in heat detection at www.protectowire.com or contact your nearest Protectowire Distributor.

PROTECTOWIRE FireSystems

The Protectowire Company, Inc.
60 Washington Street
Pembroke, MA 02359-1833 U.S.A.
781-826-3878; www.protectowire.com
An ISO 9001:2008 Registered Company

CTI Series . . .
New from PROTECTOWIRE
the next great advance is here

TLX Technologies

Next Generation Actuators Provide System Intelligence and Protection

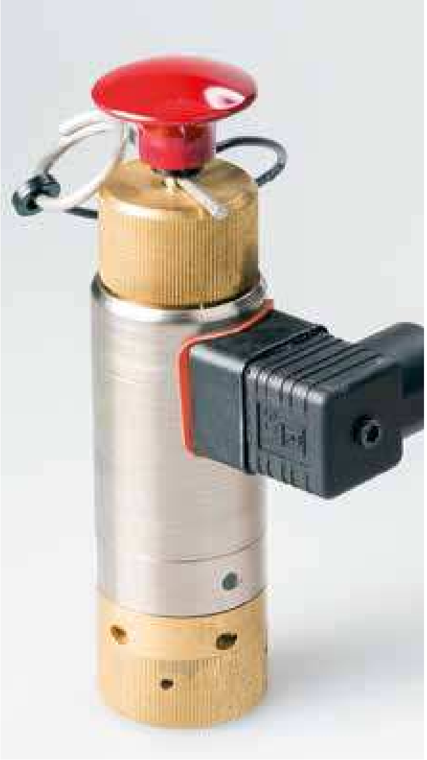
Protection of life and property has always been the primary purpose of fire suppression equipment manufactured by system manufacturers globally. While configuration of these systems can differ based on the system components, the extinguishing agent and the environment in which the system is used, the objective remains the same.

One of the key components in a fire suppression system is the suppressant releasing device that initiates the mechanical discharge of the extinguishing agent that will combat the fire. Many systems utilize a latching solenoid actuator, more commonly referred to as an electric actuator, as the releasing device. The actuator is attached to the discharge valve on the cylinder storing the suppressant and is electrically connected to the fire alarm control panel. Once the actuator receives an electrical signal, it will deploy, causing the discharge valve(s) to open and dispense the extinguishing agent into the system.

▼ **TLX engineers develop actuators that meet the challenging demands of suppression systems.**

TLX Technologies' latching solenoid actuators are designed for durability and ultra-fast response with consistent performance over a 15-year life span. However, the suppression system is open to potential failures due to human installation error during routine maintenance and functional testing of the actuator. If the releasing device is not fully installed onto the discharge valve, the release actuator will not open the valve and dispense the extinguishing agent, resulting in a system failure. Without an installation supervisory signal between the electric actuator and fire panel there is no indication of proper installation leaving the responsibility of accurate installment solely on the technician who removed the actuator for maintenance or testing purposes. Industry regulators quickly recognized that adding supervisory requirements to the release actuator would provide for the necessary alarm (both visually and audibly) to alert the technician on whether the actuator was correctly installed and in the right position for proper system functionality.

TLX Technologies is proud to introduce the next generation of our latching solenoid actuator for fire suppression systems with active installation supervision. The additional supervision incorporated in our next gen actuator meets the new standard (NFPA 2001, Sec. 4.3.4.1) from the National Fire Protection Association (NFPA) that is required on all clean-agent fire extinguishing systems by January 1, 2016. This new regulation addresses the concern of proper installation of the actuator by providing the necessary supervision within the actuator to provide the installation technician with both a visible and audible check to ensure proper installation.



© Images courtesy of TLX Technologies

▲ **Latching solenoid actuator with internal supervisory feature.**

TLX's UL recognized and patented component allows for fully-engaged installation detection to be configured to a system's exact needs. The component is designed with an internal supervisory feature that eliminates the need for an additional component or electrical connection. Rugged construction, ultra-fast response and the ability to be reset ensures consistent performance over the solenoid's entire 15-year life span. In addition, TLX can adapt the supervision capabilities to a pneumatic actuator for slave cylinders as needed.

For over 15 years, TLX Technologies has worked with system manufacturers to develop and manufacture custom actuators and valves to meet the challenging demands of active fire suppression systems.

For more information, go to www.tlxtech.com

We help suppression system OEMs meet regulatory standards with superior electromagnetic solutions.

Call us with your challenge.

CUSTOM AND STANDARD COMPONENTS
ULTRA-FAST RESPONSE
HIGH DURABILITY
RESETTABLE
UL RECOGNIZED COMPONENT
CUSTOM CONFIGURATION
ACTIVE MONITORING
FULLY ENGAGED INSTALLATION DETECTION
COMPLIANT TO NFPA 2001, SEC. 4.3.4.1
15 YEAR LIFE SPAN
FLEXIBLE PACKAGING
AND MORE...

TLX TECHNOLOGIES

COME VISIT US AT
Intersec 2016
Dubai, UAE
Booth #3-A34

CONTACT US:
+1 262-372-2165
www.tlxtech.com

BAUER COMPRESSORS

› Mini Verticus III Series
The most advanced compact unit system in Fire Stations and Vehicles. The system can deliever air up to 250l/min and can be upgraded to fully automatic with refrigeration dryer Air-Kool system, extrenal filling panel as well as stroage cylinders can be easily fitted.

› Containment Fill Statoins - Stationary & Mobile
BAUER offers only independently tested Containment Fill Stations which were found to protect from overpressure and fragmentation per NFPA 1901.

› BAUER Pure Air
As the market and technology leader in Breathing Air production, BAUER has instituted a Quality Seal as part of our worldwide campaign of information and quality certification in accordance with DIN EN 12021, which is in cooperation with TÜV.

BAUER PureAir - CERTIFICATE -

› BAUER COMPRESSORS ASIA PTE LTD
25 Pandan Crescent, #01-10 Tic Tech Center
Singapore 128477
Tel: +(65).6271.6271
Fax: +(65).6272.3345
Email: info@bauer-asia.com
www.bauergroup.com

TÜV SÜD

WATERAX

Helping Firefighters Move Water since the 1920s

▼ MARK-3® Portable Fire Pump.

Images courtesy of Waterax

WATERAX's mission is to design, manufacture and supply innovative portable fire pumps and water-handling equipment tailored specifically to withstand the rigors of rugged applications and environments. These include forestry, urban and marine fire control markets, as well as construction, flood control and many others. Best known for the MARK-3® and the BB-4®, high-pressure, portable, centrifugal fire pumps, which are benchmarks in the wildland firefighting community, WATERAX also manufactures a broad range of portable pumps, backpack pumps, and the supply of complimentary water-handling products.

WATERAX has a long and exciting history, which traces back to Watson Jack & Co. founded in 1898, who later began manufacturing a powerful, 200 PSI portable fire pump named the Wajax Pump in the 1920s. The 4-stage detachable pump end, that was patented in 1958, later gave birth to the iconic MARK-3® introduced in 1964 by Wajax Ltd. The MARK-3® brand, rapidly became the standard wildland lightweight, portable fire pump used by forestry agencies around the world. The Wajax Ltd. fire control business, known as the Fire Control Group, was later sold to Wildfire Fire Equipment Inc. in 1995.

Today, the WATERAX brand captures the powerful meaning and essence of the historical names Watson & Jack Co., Wajax and Wildfire. WATERAX is truly going back to its roots by doing what its ancestors did really well and aligning ourselves with the original purpose of the company. This new brand identity better communicates the core nature of our manufacturing activities and our distinctive portable pump products brand.

WATERAX products are characterized by multi-stage centrifugal pump ends designed to move water while generating high-pressure to meet the difficult requirements of wildland firefighting and other applications when you need to move water over long distances and elevation.

WATERAX pumps are built to last, and many, sold decades ago, are still in operation. The company has thus also built up a sophisticated parts and service infrastructure to support them. WATERAX products are distributed and serviced in over 40 countries through a network of dealers, distributors and fire apparatus builders.

For more information, go to www.waterax.com

◀ Pumpman at MARK-1 Mercury fire pump. Sioux Lookout, July 1961.

WATERAX
WE MOVE WATER®

WHEN IT COMES TO FIREFIGHTING, ONLY THE BEST EQUIPMENT WILL DO.

WATERAX products—like the MARK-3® pump and original HOTLINE® hose — have been setting industry standards since the 1920s, and earning the trust of firefighters nationwide. You can count on our proven products, our commitment to safety, and our dedicated staff to deliver the best possible support in your times of need. When you're fighting forest fires, you need to trust the best equipment. Count on *WATERAX*.

BECOME A DEALER TODAY
www.waterax.com | 514-637-1818 | info@waterax.com

WATERAX
WE MOVE WATER®

Tyco Fire Protection Products Advanced Technology to Transform the ANZ Fire Detection Landscape

Tyco Fire Protection Products, a division of Tyco, the world's largest dedicated fire protection and security company announced the availability of VIGILANT Generation 6 MX Addressable Fire Detectors in Australia and New Zealand (ANZ). The new Generation 6 fire detector range is comprised of Heat Detector (850H), Photo Smoke Detector (850P) and Multi-sensor Smoke and Heat Detector (850PH).

With safety and reliability integral to their design, the detectors in the Generation 6 fire detection range are all equipped with a continuous receptive self-monitoring system, a short circuit line isolator and multifunction LED indicators that are intended to let the user know if one of the detectors is out of commission. In addition, discrimination provided by Fastlogic algorithms helps to minimise false alarms from common sources and multi-sensor algorithms seek to maximise detector performance in challenging environments.

The built-in circuit line isolator works to greatly improve fault tolerance and enables all detectors to continue to operate in the event of a short circuit fault on the addressable loop. This seeks to ensure system reliability and eliminates the need for, and cost of an external isolator.

Every Generation 6 unit is fitted with an advanced optical chamber that seeks to deliver the longest service life possible whilst maintaining the correct level of sensitivity and raising the alarm threshold as the device ages. To withstand challenging environmental conditions, the circuit boards of the Generation 6 update have been treated to resist moisture and include a fully coated thermistor to resist contamination, dust and dirt, resulting in low maintenance and reduced service costs. Furthermore, the optical chamber is insect protected and features an incorporated fly screen.

▶ **The Vigilant Generation 6 detectors use advanced two way infrared technology to make testing and commissioning safe and simple.**

Images courtesy of Tyco

Commenting on the ANZ launch of Generation 6 fire detectors, Geoff Fiala, Director of Asia Pacific Tyco Fire Detection Products said, "We are delighted to offer our ANZ customers this world first technology. Our customers demand efficient, accurate, safe for installation and easy to use products to get the job done, and every element of Generation 6 is designed to save them time and money, without compromising safety. When it comes to installing, commissioning, troubleshooting and testing of fire detection systems, customers should only have to do it once and get it right the first time."

The innovative Generation 6 fire detectors use infrared technology with remote programming capabilities designed for faster commissioning and troubleshooting, allowing users to save valuable time and money. This advanced two-way infrared technology enables Generation 6 fire detectors to be efficiently configured and tested using an easy-to-use portable hand held device – the wireless 850EMT Engineering Management Tool. Both installation and ongoing servicing and testing are now as easy as Point, Program and Go.

Generation 6 fire detectors can be made available in any pantone shade, enabling architects, consultants and designers to integrate them into the aesthetics of the surroundings and can either be an attractive feature or a discreet addition to any environment.

The non-proprietary Generation 6 fire detection products incorporate forward and backward capability, allowing building owners to save on significant upgrades, and extending product longevity and lower overall lifetime cost. For further information about VIGILANT fire detection products, call 1300 725 688 (In Australia) or +64 9 635 0760 (In New Zealand).

For further information, go to www.Gen6.com.au

KNOW YOUR INDUSTRY
BECOME AN
FPA AUSTRALIA
MEMBER TODAY!

Fire Protection Association Australia offers a flexible range of membership options to suit all stakeholders working in or associated with the fire protection industry in Australia.

Stay connected to your industry with the latest:

- **News**
- **Events**
- **Technical information**
- **Resources**

FPA AUSTRALIA

BECOME A MEMBER TODAY **Call 1300 731 922**
Email member@fpaa.com.au **Visit** www.fpaa.com.au

Exova Warringtonfire

Exova Warringtonfire Aus Pty Ltd

At Exova, we're your local, global partner. Whatever your fire testing requirements, our NATA accredited lab will ensure high quality and rigorous testing every time. Based in Australia, Exova Warringtonfire Aus can test to worldwide standards including:

• AS	Australia
• IMO	International Maritime Organisation
• BS	British Standards
• EN	European
• UL/ASTM	American
• DIN	German

Wherever your product is heading, test it with Exova.

Exova - Local lab. Global capabilities.

Call today for a quotation
t: + 61 (0) 3 9767 1000
w: www.exova.com
e: market.pacific@exova.com

Fire Australia + Hazmat 2016

16
FIREAUSTRALIA
+ HAZMAT
CONFERENCE & TRADESHOW
4+5 MAY 2016
MELBOURNE

Fire Australian & HazMat 2016 is the premier event for the fire protection and hazardous materials sector.

Traditionally run as separate events, in 2016 Fire Protection Association Australia will combine these two sectors together into a bigger and better conference and tradeshow that promises to attract key decision makers and leading subject matter experts from government and industry.

The conference and tradeshow will attract key industry professionals from the fire protection, fire safety, and emergency management and hazardous materials sectors from across Australia and overseas as well as representatives of government and fire agencies.

The Tradeshow

The tradeshow at Fire Australia & HazMat 2016 will be the largest of its kind in the southern hemisphere, showcasing products and services for the fire protection and hazardous materials sectors.

▼ **The 2015 tradeshow was the largest in the history of Fire Australia and the 2016 event is sure to be even bigger.**

© Image courtesy of Fire Australia + Hazmat 2016

Building on the sold-out success of the 2015 tradeshow on the Gold Coast, the organisers have secured the largest ever space for a Fire Australia tradeshow at the iconic Melbourne Convention and Exhibition Centre.

This spectacular venue will cater for an exhibition space of over 2500m2 allowing for over 70 exhibition booths, easily eclipsing the 1800m2 available at the Gold Coast event in 2015.

Once again the exhibition space will be central to all activities including the catering and café seating areas and the Showcase Theatre – a dedicated presentation area where sponsors and exhibitors will be able to showcase their products and services to all conference and tradeshow attendees.

The Conference

In line with the 2016 theme "Risk, Liability, Exposure" The conference will include presentations that span three specific streams:

- Fire Protection Strategic Stream (Risk, Liability, Exposure)
- Fire Protection Technical Stream
- HazMat Stream.

Fire Protection Strategic Stream

This stream of presentations will be tailored to managers and business owners, government representatives and fire safety professionals including those with an interest in regulations, policy, codes, standards and management systems.

Presentations will be aligned to the conference theme and address either "Fire Risks" or "Business Risks". Panel sessions will occur at the end of each session for discussion and questions. This stream may also incorporate a debate or discussion on the conference theme.

Presentations are likely to include information on:

- Integrating risk assessment across design, engineering, approval, installation and commissioning.
- Business continuity planning
- Case studies on unique design solutions
- Reducing risk through the use of "tested" products and systems
- Getting the right design solution – from concept to practical completion
- Product innovation and design – treating complex risks
- High-rise residential development – have building standards kept pace with community expectations
- The insurers perspective on fire risk
- Business survival when something goes wrong
- How do I best protect my business and my reputation from an insurance claim
- Latest trends in insurance claims and the consequences to the fire protection sector
- Other than insurance – what else should I be doing to protect my business and my employees
- Managing brand erosion and damage

Fire Protection Technical Stream

This stream will run throughout the conference and will provide relevant presentations for fire technicians, building surveyors & certifiers, systems designers and installers, engineers, consultants, maintenance personnel and those involved with the technical aspects of fire protection systems and equipment.

This stream will include case studies, product innovation and development and information on contemporary matters related to many of the following areas:

- Early Warning & Detection
- Fire Suppression
- Passive Fire Protection
- Emergency Planning
- Maintenance
- Bushfire
- Product Testing and Approval

Hazmat Stream

This stream will address topical and current subjects within the chemical management, dangerous goods, hazardous materials and affiliated industries.

Speakers in this stream will focus on the conference theme as it relates to the sector and may also include presentations on any of the following subject areas:

- Safe transport of chemicals and dangerous goods
- Dangerous goods transport and storage incidents
- Insurance industry perspective with chemicals and dangerous goods incidents
- Implementing plans to comply with GHS
- Risks with nanotechnology
- Management of industrial waste
- Environmental impact from chemicals
- Managing Contaminated sites

Get Involved

With the recent decision to combine both the Fire Australia and HazMat events, FPA Australia is confident that the 2016 Fire Australia and HazMat event will be the largest ever.

If you would like to sponsor the event or participate as an exhibitor at the tradeshow, now is the time to secure your position as these options are limited and do sell out.

Image courtesy of Fire Australia + Hazmat 2016

▲ Fire Australia & HazMat provides the perfect opportunity to learn about the latest products and services while networking with industry colleagues.

▶ The 2016 conference will feature high profile keynote speakers from Australia and abroad.

FPA Australia would also like to invite all readers of Asia Pacific Fire Magazine to attend the 2016 Fire Australia and HazMat conference and Tradeshow as a delegate! Entry to the tradeshow is absolutely free and conference entry is available for single day passes or for the full two days of the conference.

We look forward to seeing you at Fire Australia & HazMat 2016.

For more information, go to www.fireaustralia.com.au

16
FIREAUSTRALIA
+ HAZMAT
CONFERENCE & TRADESHOW

10 Tanker Air Carrier

Buying several DC 10 passenger aircraft and converting them to aerial fire fighting jets is not for the feint hearted., but that's exactly what 10 Tanker Air Carrier of Albuquerque New Mexico did.

Mark Robertson

10 Tanker initially selected the DC-10 aircraft type for development after evaluating numerous modern jet aircraft. This aircraft type appropriately aligns capability with capital requirements versus operating cost criteria for a low utilization operation. The Company's multiple use STC from the FAA for modifications to the DC-10 aircraft was issued in March, 2006. Obtaining a STC for a modification of this caliber exposes significant capital to a high degree of uncertainty. With a strong belief in the future capabilities of this type, 10 Tanker assumed the capital risk and achieved the modifications. 10 Tanker then obtained a FAA CFR 14 – Part 137 Operating Certificate for aerial firefighting and then finally the USFS Interagency Airtanker Board approval for use as an aerial fire fighting aircraft.

Firefighting operations commenced in 2006 with a contract from the state of California. Interest in these heavy jets was spreading, and 2011 and 2012 fire seasons brought increased demand from the US Forest Service as this innovative tool gained acceptance with a growing population of field commanders across multiple fire agencies. In 2013 the Company was awarded the first "Next Gen" fixed wing airtanker contract by USFS. From the start of operations in 2006 thru the completion of the 2015 fire season, two Company aircraft, flying 1700 missions had accurately delivered in excess of 15 million gallons of retardant. This would have required over 5000 flights by the next largest airtankers available and would have more than doubled the cost with less effectiveness.

▼ 10 Tanker conducting a one mile long drop.

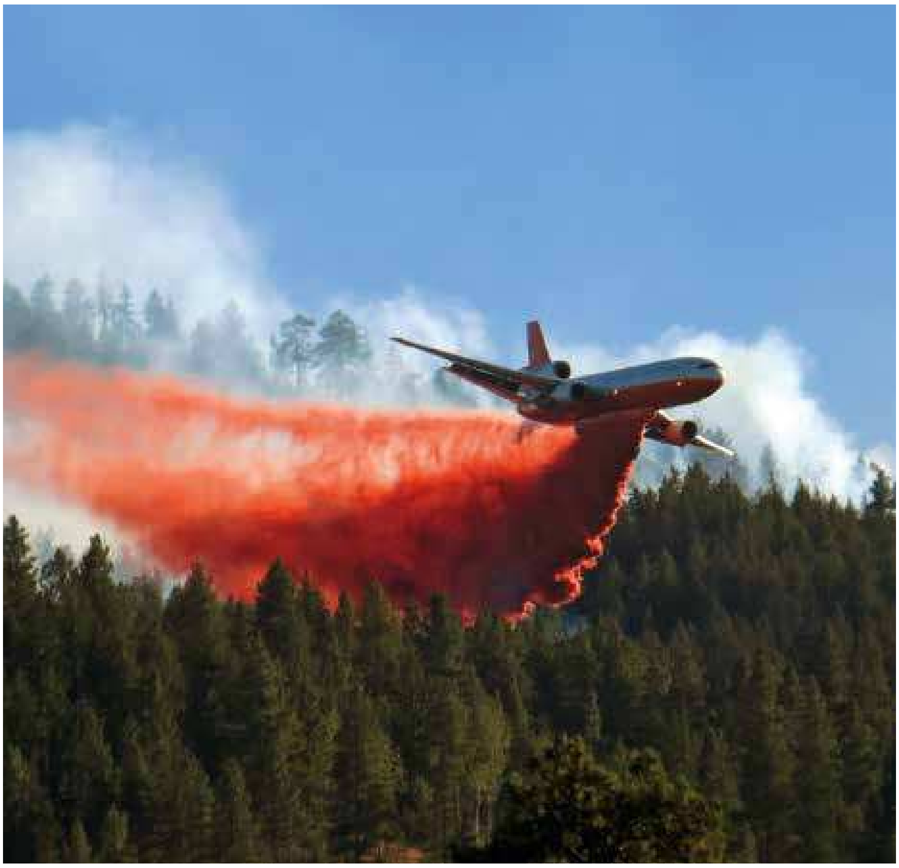


Image courtesy of 10 tanker Air Carrier

Mark Robertson, Manager, Australia, 10 Tanker Air Carrier.

Image courtesy of 10 tanker Air Carrier

▲ **10 Tanker laying a long line of retardant in mountainous terrain.**

Even with a full load of 44,000 litres of retardant, the DC10's operate well below the gross weight that they operated on as international passenger carrying jets. This high power to weight ratio sees the aircraft extremely powerful, and surprisingly, very maneuverable as they negotiate terrain, smoke and other aircraft as they set up for the retardant dropping run. Add highly qualified and experienced flight crews, and it is no wonder that Incident commanders utilizing 10 Tanker are continually giving the Company high marks for its unique contribution to wildfire suppression and containment. Another powerful advantage of these DC10 jets is their ability to cover a lot of territory in a short space of time. Jet aircraft speed with international jet range, combine to make heavy jet fire fighting aircraft a reality over a very broad area. This long-range capability means that that 10 Tanker can operate over vast areas of large countries like Australia and the USA, whilst lesser aircraft would be stopping for fuel en route. More time fighting fires and less time stopping for fuel increases the advantages of these DC 10 aircraft.

The 2015 season has seen the Company fleet of three aircraft flying over 400 missions on 75 fires across the USA. In recognition of the abilities of 10 Tanker, the Company was awarded an additional Exclusive Use contract by USFS, which will commence in 2016. The work done by 10 Tanker has not gone unnoticed internationally and 2015 saw the company awarded a contract by the National Aerial Firefighting Centre (NAFC) for use by NSW, Australia. Operations in NSW commenced on 1st October 2015.

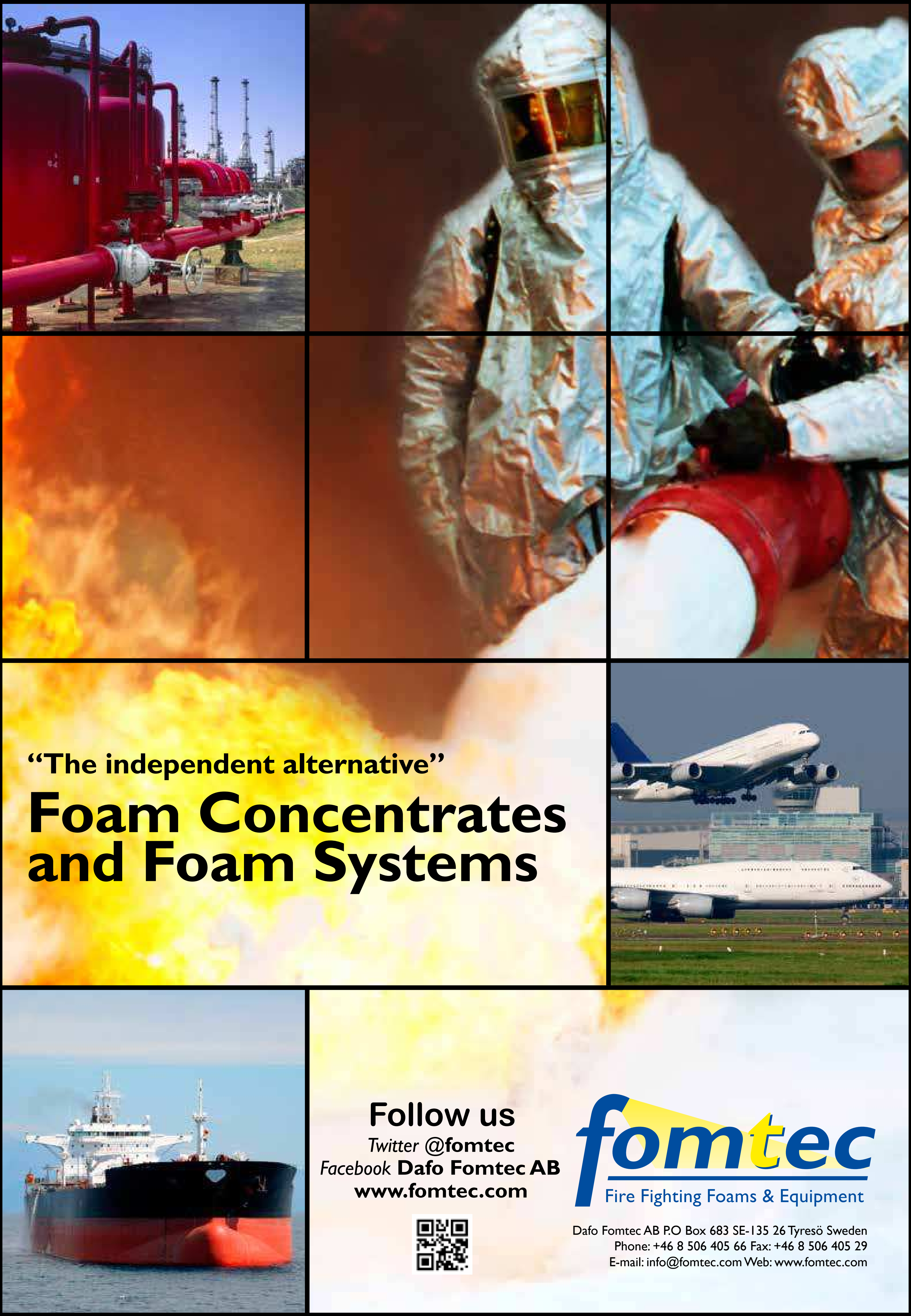
Whilst it took some people a while to accept the concept of very large air tankers, the company has achieved success by development of a safe and effective product that is truly a step change in productivity and cost effectiveness. A certified Structural Integrity Program ("SIP"), a reliable maintenance program, a robust aircraft type, and an effective, proven retardant delivery system all combine to make Company aircraft "game changers" in this specialized industry of limited access.

Government agencies are significantly short of capacity to match historical and forecasted volumes of suppressant needed on wildfires. There are four principal reasons why additional aircraft of the DC-10's capability will provide fire agencies with timely additions to their airtanker fleets:

1. Enhanced SAFETY – a platform delivering superior maneuverability and reduced flight exposure due to its dramatic capacity advantage.
2. Suppressant capacity exceeding alternative aircraft by a factor of 3.5 or more.
3. Aircraft meeting or surpassing all stated contractual requirements operated by an established company with proven aviation and aerial firefighting experience.
4. Significant cost effectiveness versus alternative delivery vehicles.

10 Tanker Air Carrier has blazed a new frontier with outstanding success. You can tell when an operation is running smoothly… professional flight and maintenance crews, and an overall feeling of satisfaction coming from a job well done.

For more information, go to www.10tanker.com



“The independent alternative”

Foam Concentrates and Foam Systems

Follow us
Twitter **@fomtec**
Facebook **Dafo Fomtec AB**
www.fomtec.com

fomtec
Fire Fighting Foams & Equipment

Dafo Fomtec AB P.O Box 683 SE-135 26 Tyresö Sweden
Phone: +46 8 506 405 66 Fax: +46 8 506 405 29
E-mail: info@fomtec.com Web: www.fomtec.com

Aspects of Foam Need Careful Consideration – Part 1

There is much discussion about which options are best for future decision-making for Class B firefighting foam applications. It needs careful consideration before making such decisions to ensure the foams chosen will provide the required levels of not only environmental performance, but also firefighting performance and life safety. It's a complex issue so we are covering it in two parts with this part 1 article now and part 2 following in the next issue.

Mike Willson

Mike Willson has over 25 years experience in the fire industry across many sectors including Aviation, Refineries, Brigades, bulk fuel storage, much of it involved in flammable liquids as a technical specialist on Class B foams, their application and associated foam delivery systems.

To achieve a balanced and workable approach requires a more holistic view than a simplistic "one size fits all" stance with mis-categorisation and fearful focus on PFOS and its unacceptable environmental behaviour, resulting in mis-representative and unbalanced views, as has been happening in some areas. Short chain C6 fluortelomer surfactants behave very differently from PFOS, with acceptable environmental performance, along with the required effectiveness and life safety requirements necessary to avoid detrimental decision-making and objectionable outcomes in the longer term. Read on to find more clarity to inform your own answer in this complex area.

▼ This 82m diameter gasoline storage tank was burning for 12 hours before being extinguished in 65 minutes with fluorinated AR-AFFF. 25 million litres of fuel were safely recovered following the incident.

Image courtesy of Industrial Fire World

PFOS should be a legacy issue

PFOS (PerfluoroOctanyl Sulfonate) and PFHxS (PerFluoroHexane Sulfonate) as most already know are significant breakdown products derived from the Electrochemical Fluorination Process by 3M, which ceased production by 2002 outside China, so should be a legacy issue. PFOS is confirmed Persistent, Bioaccumulative and Toxic. It has long range mobility, is harmful to humans being proven carcinogenic, transfers to the foetus and is found in human breast milk. It also causes harm to our environment, and is listed under the Stockholm Convention as a Persistent Organic Pollutant, or POP.

PFOS is banned from use across the EU[1] and Canada[2], and little used elsewhere, except China where it is still produced. The disposal recommendation is high temperature incineration because of its POP profile, but although generally no longer available PFOS & PFHxS

© Image courtesy of Angus Fire

▲ **Fluortelomer surfactant based foams provide safety for firefighters from sudden flashback or re-ignition because of the fuel shedding capabilities of these fluorochemical ingredients.**

still reside in some fixed foam and pre-engineered systems ready for discharge, should fire strike.

There could be penalties for discharging PFOS to the environment or waste water treatment systems in some jurisdictions, as occurred following the 2005 Buncefield fire in UK when £1.35m[4] of the total £9.5m fines and costs were attributed to environmental pollution, so it is well worth transferring any existing systems containing PFOS based foams into different containers, thoroughly cleaning out the systems and holding the residues, before determining the most suitable remediation treatment for safe disposal. PFOS should now be a legacy issue, but we still need to manage it. Most regulators advise foam users to avoid using PFOS based agents.

Many have done this already, replacing PFOS-based foams with either C6 fluorotelomer surfactant based foams, or completely Fluorine Free Foam (F3). But which foam type delivers the best long term solution to meet increasingly stringent environmental requirements, while also providing effective and efficient firefighting capabilities? This is a more complex Question than many imagine, but these two articles will shed light on that dilemma, to help make your decision-making clearer and perhaps a little easier.

Some foam users are misleadingly told that “all fluorochemicals can behave like PFOS” to encourage a shift to F3, which is far from the truth. This approach mis-represents the alternative telomer-based fluorochemicals, particularly the high purity, short-chain C6 fluorotelomer surfactants, which are not bioaccumulative, have low toxicity, behave very differently from PFOS and have acceptable environmental profiles[3].

How are C6 Fluorotelomer foams different?

The fluorotelomer process does not use PFOS as an ingredient, and does not produce PFOS as a breakdown product. Trace amounts of PFOA (PerfluoroOctanoic Acid) are unintentionally formed in the production process, but manufacturers voluntarily agreed to the US EPA’s PFOA Stewardship Program in 2006, with the goal of reducing PFOA from their waste streams, production processes and finished products by 95% in 2010, which has been achieved[5]. They are now working towards eliminating PFOA and its precursors by end 2015 to such a level that can meet the latest European Chemicals Agency proposed restriction levels for PFOA in firefighting foams[6].

Longer chain fluorotelomer surfactant-based (≥C8) foams containing small amounts of PFOA have been already undergoing transition to short-chain predominantly C6 fluorotelomer-based alternatives. The EPA program spawned a broader focus on creating these more environmentally benign foams[7],[8] using short chain, predominantly six carbon or C6 fluorotelomer surfactants, which behave very differently in the environment and humans from PFOS and PFOA. These high purity 99.5% C6 fluorotelomer surfactant-based foams are now available, that can comply with the latest European Chemicals Agency PFOA acceptability limits[6] of 1,000ppb (parts per billion, when 1ppm = 0.0001%) for PFOA and each of its precursors, which allows foams containing these C6 fluorotelomer surfactants as alternatives to those known as “PFOS foams” and “PFOA foams”.

The differences between PFOS and C6 are confirmed by extensive scientific research. This shows C6 fluorotelomer surfactants exhibit low toxicity to aquatic organisms and mammals like us[13]. They

fireray®
The world's most trusted beam

Fireray® 3000 Exd
Flameproof Optical Beam Smoke Detector

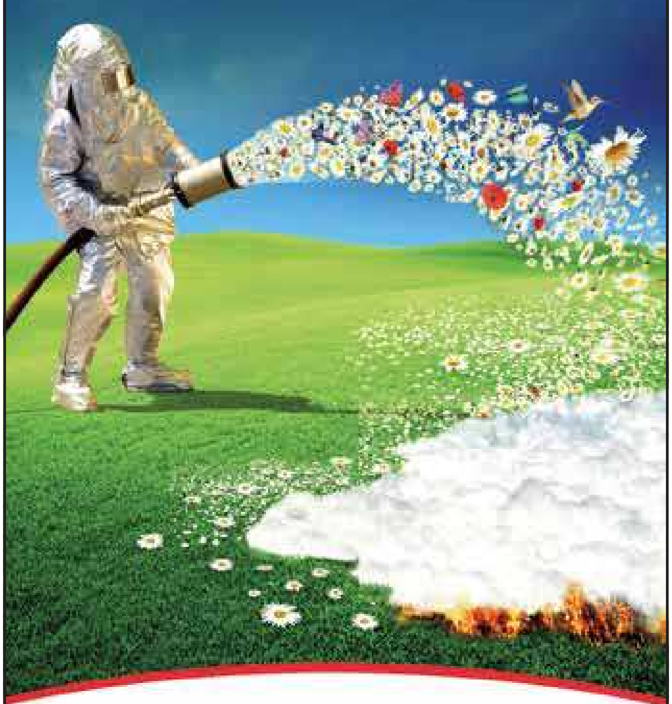
- Range 5 - 100 metres
- Automatic Gain Control for drift compensation
- Complies with ATEX and EN 54:12
- Patented light cancellation technology cancels unwanted light

ffe

T +44 (0) 1462 444 740
E sales@ffeuk.com
W www.ffeuk.com

BIOex
Foam concentrates

Fight the fire but
protect what's essential !



In 2002, BIOex was already committed to the protection of our environment by launching the first fluoro-free foam concentrate.

Today, BIOex designs and manufactures fluoro-free foam concentrates tested and approved by our customers worldwide:

- ▶ ECOPOL: all-risks
- ▶ BIOFOR: wetting / foaming agent
- ▶ BIO T: the training concentrate

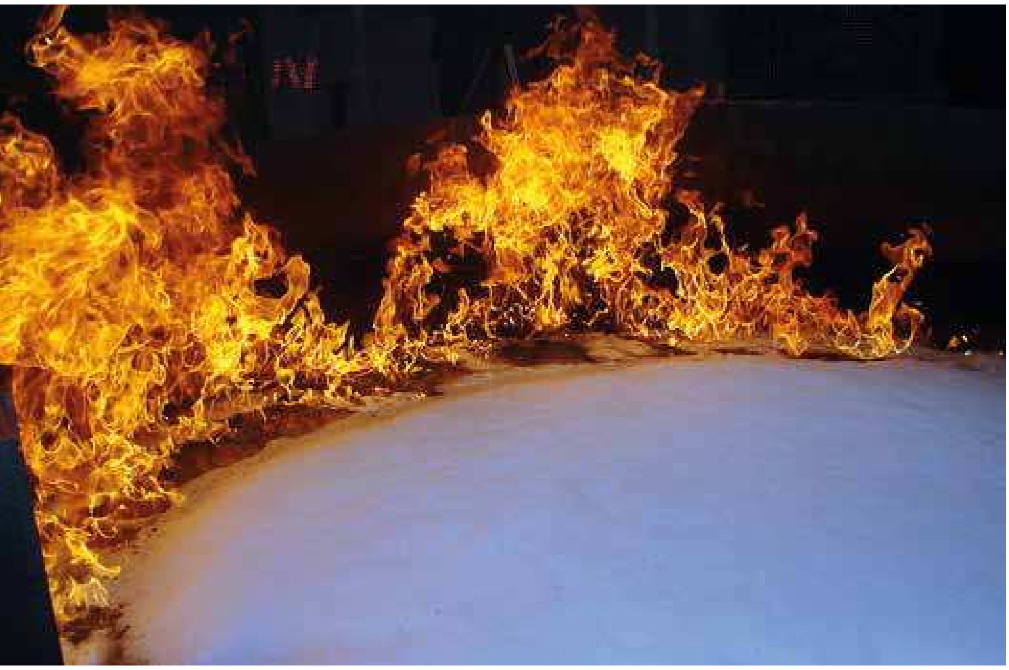
BIOex also offers a complete range of synthetic and protein based foam concentrates.

Certifications: EN1568, ISO7203, ICAO, IMO, VERITAS, LASTFIRE, GESIP, UL, FM, APSAD R12

▶ www.bio-ex.com

BIOex extinction by nature

DA / graphisme : www.guillaumerobert.fr



◀ **Fluorine free foam exhibits poor edge sealing ability against hot metal during a Lastfire test.**

Image courtesy of Mike Wilson

are not bioaccumulative, nor biopersistent, nor biomagnifying[8-10]. Further studies have shown they are not mutagenic, nor carcinogenic, nor developmental nor reproductive toxicants[11],[12], and have not been shown to be harmful to human health[13]. They seem to have a low risk of long range transport binding to sediments[14], and a recent risk assessment showed they cannot qualify for POP listing[14], as 3 out of the 4 key criteria required for POP listing, are simply not met.

C6 fluorotelomer surfactants are still persistent, but so is concrete, yet this C6 persistence is not shown to be harmful to either humans or the receiving environment [7–14].

Why is foam so beneficial?

Lets go back a step… why do we need foam anyway? Wouldn't it be better if we could just use water?

Water is heavier than most hydrocarbon and polar solvent flammable liquids. It sinks through the fuel layer and rapidly spreads the flaming fuel into other areas, quickly escalating the fire.

Foam is lighter than water and floats on the fuel surface, providing a suppressing foam blanket to minimise fire spread, provide swift control and cool the fuel. It also protects casualties and firefighters from flames, helps minimise the risk of re-ignition, protects property and investments, minimises business

ELKHART BRASS
- Monitors
- Nozzles
- Valves

FRC
- Scene Lighting
- Governors
- Gauges

FOAMPRO®
- Foam Proportioners

R·O·M CORPORATION™
- Roll-up Doors

EMERGENCIES DEMAND PERFORMANCE.

Welcome to Safe Fleet, the leading global provider of safety solutions for fleet vehicles. One company offers you the most extensive selection of products for the emergencymarket; including our brands that have been helping to battle fires for 125 years. Safe Fleet delivers experience and reliability that guarantees performance.

Visit us at Intersec, booth #2-H14, to learn more about what we can do for you.

SAFE FLEET
Emergency

Thomas Fahrenbach
Sales Manager, Europe & Middle East
Phone: +49 6159 7174223
tfahrenbach@safefleet.net

Tim Schanno
Sales Manager, Asia & Pacific
Phone: +1.763.280.0895
tschanno@safefleet.net

www.safefleet.net

interruption and financial loss, while also minimising environmental impacts and press attention by controlling the incident quickly! But care needs to be taken… as not all foams behave the same.

Fluorotelomer surfactants are necessary

To achieve all this… C6 fluorotelomer surfactants have been effectively used in AFFF foams for the past 40 years. They provide a critical fuel shedding function[15]. This prevents the foam from picking up fuel into the bubbles when it is forcefully applied to the fire, as occurs in most practical firefighting incidents[15], like the 9m diameter storage tank test in Rotterdam[16] and the 2001 Orion 82m diameter tank fire in USA[17]. It also provides a vapour seal on hydrocarbon fuels, faster knockdown of the fire, often with lower application rates, so there is less smoke, less run-off and less pollution by minimising the foam and water resources needed.

These fluorotelomer surfactants also reduce the risk to life safety from sudden flashbacks and re-involvement[15], which can occur when these vital ingredients are missing, particularly on volatile hydrocarbons, such as gasoline.

Consequently they deliver reduced environmental impacts of low aquatic toxicity, their persistence has not shown to be harmful , they are not bioaccumulative, and produce less firewater run-off which could contribute to pollution.

Are there acceptable alternatives?

The main alternative to fluorinated foams is Fluorine Free Foam (F3) and some support these products as the most environmentally acceptable answer, yet there seems to be no fate and behaviour studies. Small qualifying fire tests often show good results, but there seems to be no evidence where major fires have been successfully extinguished by F3 products, it always seems to be fluorinated foams – why is this?

Research has also shown that even "the best performing F3 formulation provides only about 30% of the durability of an AFFF for protection against evaporation of low-flashpoint flammable liquids (like gasoline)[18]." So 3 times more F3 is likely to be needed to provide equivalent vapour sealing on volatile fuels, particularly when applied forcefully from standard foam branchpipes or water nozzles, when compared to fluorotelomer based foams like AFFF as Jho's 2012 research shows[15].

This was underlined by a 2013 Caltex incident[19] where a F3 foam blanket lasted only 15-20 minutes before requiring top-up on a pressurised unleaded gasoline leak from the base of a bulk storage tank. Considered unacceptable, subsequent use of a Fluoroprotein foam lasted 90 minutes between top ups, 5 times longer, which was considered excellent and allowed the incident to be brought under control.

Large scale test fires involving polar solvent fuels like Ethanol are likely to deliver at least twice the heat exposure of gasoline within a 30-40m radius[20], and Alcohol Resistant foams require gentle application to be effective. F3 agents struggle with extinguishing even small test fires of industrial alcohols like IPA[21] or Ethanol, so large tank fire scenarios may be uncontrollable, when semi-forceful foam application is almost inevitable.

Consequently it is increasingly being suggested each drum of these F3s should exhibit a warning label confirming it should not to be applied forcefully onto fires involving volatile fuels like Gasoline, to protect the safety of firefighters, as many seem unaware of the inherent dangers. This is particularly relevant to large areas of in-depth fuel in bunded areas, bulk storage tanks, transporting vehicles and ship tankers, and should be an important consideration when selecting future foam concentrates.

Dr.STHAMER HAMBURG

NEW! **MOUSSOL®-APS 1x3 F-0**
EN1568 part 3 1A/1A,
LASTFire Tested

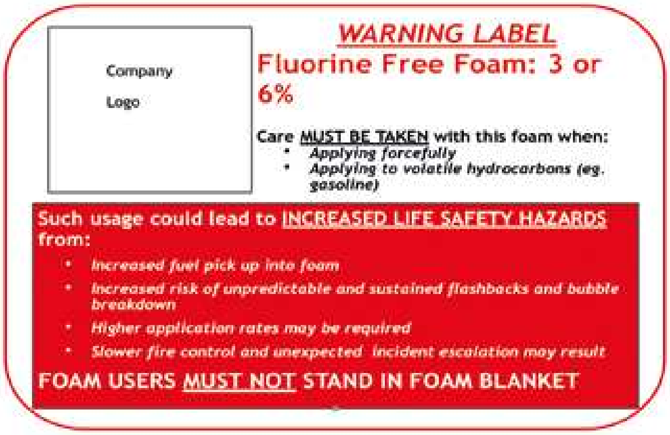
We offer a full range of Internationally Approved, High Performance, Environmentally Compatible Fire Fighting Foams.

24/7 EMERGENCY SUPPLIES PLEASE CALL + 49 40 7361680

Liebigstraße 5 · 22113 Hamburg · Germany
Phone +49 40 73 61 68-0 · Fax +49 40 73 61 68-60
E-mail: info@sthamer.com

www.facebook.com/Dr.Sthamer

www.sthamer.com



WARNING LABEL

Fluorine Free Foam: 3 or 6%

Company

Logo

Care MUST BE TAKEN with this foam when:

- *Applying forcefully*
- *Applying to volatile hydrocarbons (eg. gasoline)*

Such usage could lead to INCREASED LIFE SAFETY HAZARDS from:

- *Increased fuel pick up into foam*
- *Increased risk of unpredictable and sustained flashbacks and bubble breakdown*
- *Higher application rates may be required*
- *Slower fire control and unexpected incident escalation may result*

FOAM USERS MUST NOT STAND IN FOAM BLANKET

◀ Potential warning label which may assist foam users realise the additional safety hazards associated with using Fluorine Free Foams, particularly during forceful application onto volatile fuels.

Might a potential warning label look something like this perhaps?

Independent fire tests conducted in Denmark 2012 showed that all five F3 foams tested failed to extinguish ICAO level B fire tests on Jet A1 fuel with the regular UNI86 test nozzle[21], when 3 were certified to pass, suggesting variability. Even poorer performance occurred, through a more realistic modified nozzle[21] that better represented foam quality likely to be produced from typical foam nozzles used on the airfield. Two of the leading F3 products also failed the gentle EN1568-3 Heptane fire test with the UNI 86 test nozzle. All these tests were conducted in freshwater and are likely to have been worse had seawater been used.

Refinery testing in Rotterdam on a small 9 metre diameter fuel storage tank containing light gasoline occurred in 2010. Gasoline was ignited and immediately attacked with 7 Litres/min/m^2 of aspirated Alcohol Resistant (AR) 3x6 F3 foam at 6% (effectively double strength for a hydrocarbon fuel), with no preburn period, yet no significant control of the fire occurred even after 15 minutes[16]. The application rate was increased to 18.2L/min/m^2 (3 times the NFPA 11 recommendation for portable monitor use at 6.5L/min/m^2) for a further 15 minutes, with still little or no impact on the fire. It eventually extinguished after 31 minutes when all the fuel burnt away[16]. 2 weeks before, this 9m diameter tank of light gasoline had previously been extinguished in just 2 minutes, using a fluorotelomer based AR-AFFF 1x3 foam at this Refinery's regular 10.4L/min/m^2 application rate[16].

Contrast this fundamentally poor F3 performance with a 82 metre diameter fully involved Gasoline tank fire at Orion Refining in 2001 which had been burning for 12 hours before being extinguished in 65 minutes at an application rate of 8.55L/min/m^2 also with AR-AFFF[17]. Subsequently 25 million litres of gasoline were also safely recovered from this tank. Which would you prefer to rely on – fluorinated or fluorine free agents, to protect your most valuable assets?

This article will be continued in the March issue, where we examine what causes fluorine free foams to suffer these fundamental problems, particularly when forcefully applied to volatile fuels like gasoline.

We also look at aquatic toxicity issues and the interesting findings from a recent Australian firefighter study. Take a sneak preview with this captivating you tube link… just Google " flammable firefighting foam![22]" and keep reading the next issue for part 2, to find out more…

For more information, email willsonconsulting26@yahoo.com.au

References

1. European Union, 2006 – Directive 2006/122/EC, PFOS restriction from use across EU after 27 June 2011 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:372:0032:0034:en:PDF

2. Environment Canada, 2008 – SOR 2008-178 Perfluorooctane Sulfonate and its Salts and Certain Other Compounds Regulations http://laws-lois.justice.gc.ca/eng/regulations/SOR-2008-178/page-1.html

3. NICNAS, 2015 – Inventory Multi-tiered Assessment and Prioritisation (IMAP) Environmental Tier II Assessment for Short Chain PerfluoroCarboxylic Acids and their direct precursors, http://www.nicnas.gov.au/chemical-information/imap-assessments/imap-assessments/tier-ii-environment-assessments/short-chain-perfluorocarboxylic-acids-and-their-direct-precursors

4. Clyde and Co, 2010 – Buncefield Explosion – Fines and Costs £9.5million, http://www.clydeco.com/uploads/Files/Publications/2010/Buncefiled%20explosion.pdf

5. US Environmental Protection Agency (EPA),2015 – PFOA stewardship program update – reported reductions in 2014 stewardship reports, http://www2.epa.gov/sites/production/files/2015-10/documents/2014_stewardship_web_site_table_final.pdf

6. European Chemicals Agency (ECHA),2015 – Committee for Socio Economic Analysis (SEAC) opinion on restrictions for PFOA, its salts and related substances, http://echa.europa.eu/documents/10162/563e9186-6fde-442f-94db-fc7cd534054e

7. Dynax ,2015 – C6 Fluorotelomer technology for firefighting applications, http://www.dynaxcorp.com/technology/firefighting.html

8. Hoke et al, 2015 – Screening risk assessment for 6:2 Fluorotelomer sulfonate (FTS), Chemosphere_128_258-265, 2015.

9. Korzeniowski S et al, 2013 –Biodegradation, Toxicology and Biomonitoring: AFFF Fluorotelomer based Short-chain Chemistry, Reebok Conference, Bolton, UK March 2013

10. Chengalis, C.P. et al., 2009 -Comparison of the toxicokinetic behaviour of perfluorohexanoic acid (PFHxA) and nonafluorobutane -1-sulfonic acid (PFBS) in monkeys and rats. Reprod. Toxicol. 27, 400-406

11. Kaunig, Iwai et al, 2014 –Evaluation of Chronic Toxicity & Carcinogeneity of PFHxA in Rats. Toxicol. Pathology ,May2014 DOI: 10.1177/0192623314530532

12. Barmentlo et al, 2015 – Acute and Chronic toxicity of short-chain PFAS to Daphnia, Environmental Pollution DOI: 10.1016

13. Russell, Nilsson, Buck, 2013 – Elimination Kinetics of PerFlouroHexanoic Acid in Humans and comparison with mouse, rat and monkey, Chemosphere, Sep2013 ISSN 1879-1298 http://www.biomedsearch.com/nih/Elimination-kinetics-perfluorohexanoic-acid-in/24050716.html

14. Environ International , 2014 – "Assessment of POP Criteria for Specific Short-Chain Perfluorinated Alkyl Substances" prepared for FluoroCouncil. http://www.fluorocouncil.com/PDFs/Assessment-of-POP-Criteria-for-Specific-Short-Chain-Perfluorinated-Alkyl-Substances.pdf

15. Jho C, 2012 – "Flammability and degradation of fuel contaminated fluorine-free foams", International Fire Fighter, Dec 2012, MDM publishing.

16. German Refinery, 2010 – Fire tests conducted at refinery and Falck-Risc Training Centre, Rotterdam small storage tank with re-healing F3 foams (which failed) – personal communication. (Confirming other personal communications from other sources).

17. Persson & Lonnemark, 2004 – Tank Fires: Review of fire incidents 1951–2003, BRANDFORSK Project 513-021, SP Sweden.

18. Schaefer T, et al, Sealability Properties of Fluorine-Free Firefighting Foams, University of Newcastle, Australia, 2008, Fire Technology Vol 44.issue 3 pp297-309 http://novaprd-lb.newcastle.edu.au:8080/vital/access/manager/Repository/uon:4815;jsessionid=E0140D586B0467E75B68993EBC83A1CA?exact=sm_subject%3A%22vapour+suppression%22

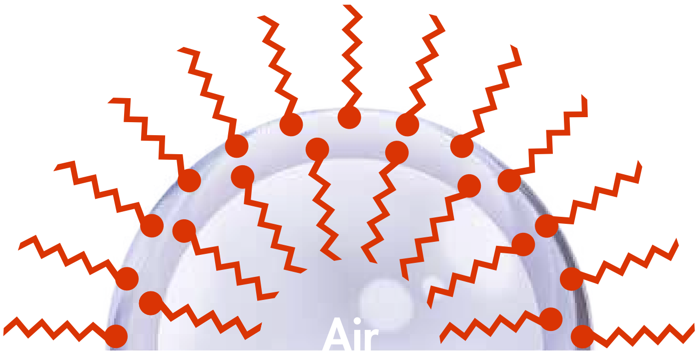
19. Caltex, 2014 – Case Study: Banksmeadow Unleaded Petrol Release 2013, HazMat Conference, Preston Victoria,2014

20. Sjöström et al, 2015 – Etankfire – Experimental Results of Large Ethanol Fuel Pool Fires, SP Sweden.

21. Hubert, Jho & Kleiner, 2012 – Independent Evaluation of Fluorine Free Foams (F3) – A Summary of ICAO Level B and EN1568 Fire Test Results, Asia Pacific Fire p37-39, September 2012. www.mdmpublishing.com/mdmmagazines/magazineapf/

22. Flammable firefighting foams! (You Tube video), 2012 – Laboratory testing to verify fuel pickup of F3 foams www.youtube.com/watch?v=luKRU-HudSU

Fatal Attraction



Fluorine-free foam bubble

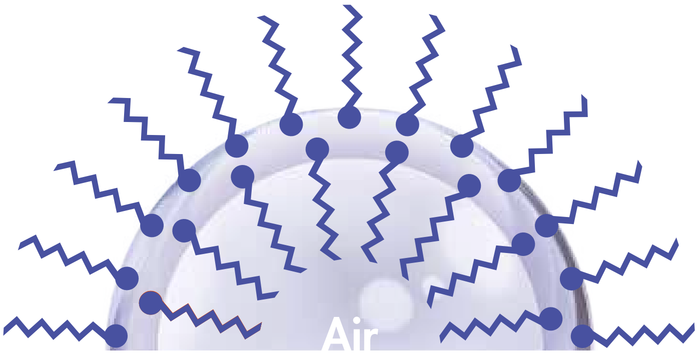
F3 Foam **attracts** hydrocarbon fuels

Hydrocarbon surfactant
(Hydrocarbon tails are fuel-loving)

FORCEFUL F3 APPLICATION:

- **Foam attracts fuel**
- **Foam becomes flammable**
- **Foam has reduced performance**
- **Foam use is increased**

Need proof? See F3 foams on fire:



Fluorinated foam bubble

AFFF Foam **repels** hydrocarbon fuels

Fluorosurfactant
(Fluorocarbon tails are fuel-hating)

FORCEFUL AFFF APPLICATION:

- **Foam repels fuel**
- **Foam is NOT flammable**
- **Foam has superior performance**
- **Foam use is reduced**

One year ahead of the US EPA 2010 / 2015 PFOA Stewardship Program deadline, Dynax only manufactures high purity C6 Fluorosurfactants, Foam Stabilizers and optimized High Performance Blends meeting the toughest fire performance specifications (including Mil F) at traditional / reduced Fluorine Levels.

DYNAX CORPORATION
PO Box 285, Pound Ridge, NY 10576 USA
T 914 764 0202 techinfo@dynaxcorp.com
F 914 764 0553 www.dynaxcorp.com

dynax
FLUOROCHEMICALS

The Art of Applied Fireproofing

Electrical power is important part of our day-to-day life that's sometime taken for granted. Almost everything needs power; we sometimes forget how it is quietly transmitted across thousands of kilometers from generating stations to homes, schools, hospitals, refineries, through essential infrastructure: the conductors. To enable efficient transmission over long distances, the power is sent at high voltage and the conductors must be covered with quality insulation material to become a capable cable.

Mark Lund

Wei-Kiang Ng

Mark Lund is a licensed Profession Engineer and he serves in industry as the Secretary of ASTM E06.21 – Building Performance, Serviceability and as Task Group Chairman for ASTM E05.11.14 Perimeter Fire Barrier Systems.

Wei-Kiang is currently the Subject Matter Expert (SME) in 3M Singapore specializing in Fire Protection Solutions. He has undertaken numerous projects, providing consultation, best practices and turnkey solutions for Construction and Oil & Gas industries.

Cable has come a long way since the first insulation material used was vulcanized rubber in the New York City power distribution system established 1882. Ever since, power insulation material has evolved into more advanced materials like Water-TreeRetardant Cross-linked Polyethylene (TR-XLPE) protecting cables carrying several hundred kilovolts. Cables are also used in fire alarm systems to trigger warning or alert system. The proper insulation materials are necessary to deploy power and signal through cables effectively.

When a fire breaks out, especially at refineries where temperatures can go up to 1100C within five minutes, the electrical insulation cable jacketing materials are vulnerable to burning away, leading to the cable losing its ability to transmit power and signal. Within minutes, the electrical circuit critical to life safety and process controls will fail, potentially endangering lives and leading to property loss and impacting business continuity.

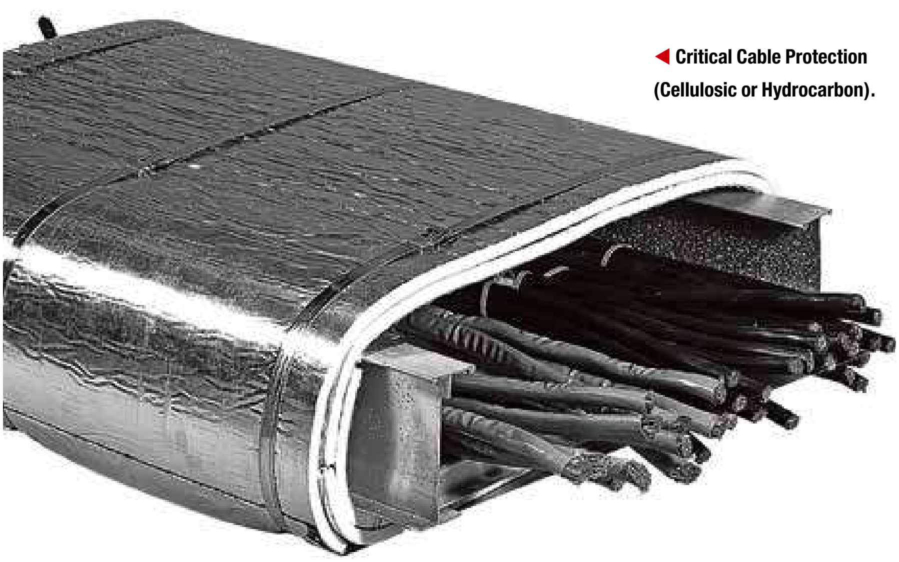
Case Study: Mid West Refinery Fire

In the late 1990's, at an oil refinery in the Midwest, a pipe containing combustible material burst, resulting in a fire plume 15 feet above ground. The fire's intense heat threatened to breech a nearby tank within the refinery that contained hundreds of gallons of hydrofluoric acid.

Immediately recognizing the seriousness of the situation, plant employees sought to move the acid to another tank away from the fire. A cable tray containing critical control circuitry required to send diverting signals to valves had been exposed to the fire. This circuitry needed to stay operational to drain out the tank and 3M Interam Endothermic Mat (commonly known as 3M E-mat) had been installed.

In such critical scenario that required lightning speed actions, it still took 30 minutes to drain out the tank.

How did E-mat help the cables to survive such severe conditions for 30 minutes, which was expected to fail within minutes as the insulation materials burns away?



◀ Critical Cable Protection (Cellulosic or Hydrocarbon).

Images courtesy of 3M Singapore

▲ **Minimal Preparation, Easy and Fast Installation.**

Endothermic Technology

3M™ Interam™ E-5A-4 Endothermic Mat "E-mat" is a flexible material that uses endothermic technology to release chemically bound water to cool the protected element and retard heat transmission in the event of fire. The product has been tested in schemes that protect power cables against 1100C degree hydrocarbon for 60+ minutes. Many oil and gas corporate fireproofing specifications call for 15-30 minutes of protection. . It is often by risk assessment that the user determines the balance of business continuity, cost and life safety. The 3M system can be tuned to address these requirement by lessening the layers of material that are applied.

What is the art behind this hour of circuit protection where many expect to fail within minutes?

The Power Cable

Wires in the power cables can work at very high temperatures and sometimes at intermittent temperatures of up to 250C until oxidation would occur. But in the industry, rarely one would rate their cables at 250C but rather at a maximum of 90C normal operating temperature and up to 40 years of longevity at this normal operating temperature. This is driven by the insulation material's characteristics that actually age over time with temperature. Overtime 40 years the cables jacket can become brittle and more prone to breakage.

As always, there is bound to be a time, where power cables may have to be overloaded and this emergency overload temperature is generally recognized by industry as 130C. But what happens to the cable insulation lifespan?

As a rule of thumb, for every 10C rise in temperature, the cable lifespan drop by a factor of 2. This mathematical model between cable lifespan and temperature is called Arrhenius relationship.

At 130C, the cable lifespan is shortened considerably to just 1000hrs (42 days). This is why 130C is known as the 'emergency operating temperature'.

Applied Fireproofing of Cables

To ensure cables are to function in the event of cellulosic or hydrocarbon fire, the user shall determine its own cable emergency operating temperature and the required time to control the fire. In the mentioned case study, the cutoff temperature was as a maximum rise of 140C.

The threshold average temperature rise of 140C comes from the ASTM E 1725 test standard which bears the title "Standard Test Methods for Fire Tests of Fire-Resistive Barrier Systems for Electrical System Components".

In the standard, the cable functionality is dependent on the insulation material and its ability to retain its function upon fire exposure. There are various fire test studies on electrical functionality pointing out for the same composition and classification of insulation materials, the failure temperature ranged from 149C to 427C. Independent oven testing of the cables also pointed out varying temperature functionality. This discovery led to the use of temperature as an end point criteria rather than electrical functionality.

E-mat offers great flexibility and thickness consistency that can be easily applied in either 1, 2, 3 or even 10 layers depending on the requirement, and can be installed in a very quick manner. This gives tunable fire barrier protection levels. The layers can be removed easily and re-deployed to other critical protection services when needed.

E-mat offers low ampacity derating of power cable because it allows heat to be dissipated away from power cables during normal operation, unlike other insulation materials that trap heat and could lead to overheating situations.

Images courtesy of 3M Singapore

▲ Dry method fireproofing and hassle-free corrosion inspection.

▼ Up to 4 hours T-rating protection.

For telecommunication industry, fiber optics cables are often re-routed. If wrapped in E-mat access ports can incorporated into the cable trays envelope and allow for easy service and addition of cables; the cables are still identifiable. If the cables were covered in a coating the ability to identify the cables is lost.

Does the application stop here?

Structural Steel

Structural steel supports are now more commonly found in buildings and refineries. They are typically lighter than concrete and help to speed up construction of a building or storage vessels in a refinery and also taking less space. Though these are the merits of using steel, there are also areas of concerns: fire protection and corrosion.

Concrete and structural steel can both be designed to fulfill load bearing requirements at ambient conditions, but when exposed to fire steel is more vulnerable and will yield at approximately 538C. To prevent such yield and collapse scenarios from happening in an event of fire, structural steel must be protected. Older conventional methods of protection are applying cementitious or intumescent coatings. These traditional methods using cementitious and intumescent coating are sometimes called 'wet methods' of fire protection. Their installation can be labor-intensive and may include the need for a water supply, careful surface preparation, sophisticated pump systems, and have limited installation environments (humidity and temperature). There are also concerns on whether environmental exposure and live loading of a structural beam could possibly affect the adhesion or cracking of these coatings. In addition, coating is permanent and short of doing destructive testing, corrosion under insulation is very difficult to detect.

E-mat as a dry method for fire protection can be applied easily over beams and columns giving flexibility of removal and inspection for corrosion. E-mat is also tested to environmental conditions and its properties are relatively unaffected and it is mechanically attached to beams/columns. Any detachment can be easily detected and easily tightened back. Further merits would be service cables that can be installed and protected along an I-beam wrapped with E-mat, whereas using wet methods this may not be possible.

Conclusion

In any fire protection design, it is important to understand the type of elements to be protected. Be it power cables, structural steel or pipes, a user has to understand the material characteristics. E-mat provides true flexibility in protecting any of these elements as a single go-to fire protection material. The art of fireproofing can be simple when the science of endothermic technology is applied.

3M E-Mat has been used in various applications ranging from power cables, structural steel and pipes. It is the same product used for over 30 years and provides versatile and effective fire barrier protection in building and construction, oil and gas and nuclear industries.

For more information, go to www.3m.com/emat

References

ASTM E1725, Fire Tests of Fire-resistive Barrier Systems for Electrical System Components, Clause X.2.1.

3M Science.
Applied to Life.™

Fire protection so flexible you might get carried away

Tested and Trusted over 30 years

- UL 1709 (ASTM E 1529) hydrocarbon pool fire
- ISO 22899-1 jet fire
- NFPA 58, ANNEX H (NFPA 290) torch test
- ASTM E 119 (UL 263) cellulosic fire
- API 2218 (3rd Ed) Section 6.3.5 recommended practice

**Plan for the worst. Protect with the best.
3M™ Interam™ Endothermic Mat.**

3M E-Mat offers maximum fire protection for critical electrical and structural components, limiting the impact when fire does occur. And it offers important advantages over epoxy and lightweight cementitious coatings or ceramic fiber.

- **Fast and easy to apply and inspect** – minimizes human error and doesn't need to be shop-applied
- **Clean** – no need to mask or drape areas to prevent a mess
- **Can be applied in any environment** regardless of heat, cold or humidity

Learn about all of the advantages and watch the video:
www.3M.com/Emat

When exposed to high temperatures or flame, 3M's endothermic technology releases chemically bound water to slow heat transfer and reduce the rate of temperature rise.

For more information,
Visit **www.3MFireprotection.sg**
Call 3M at **(65) 6450 8888**
or email at innovation.sg@mmm.com

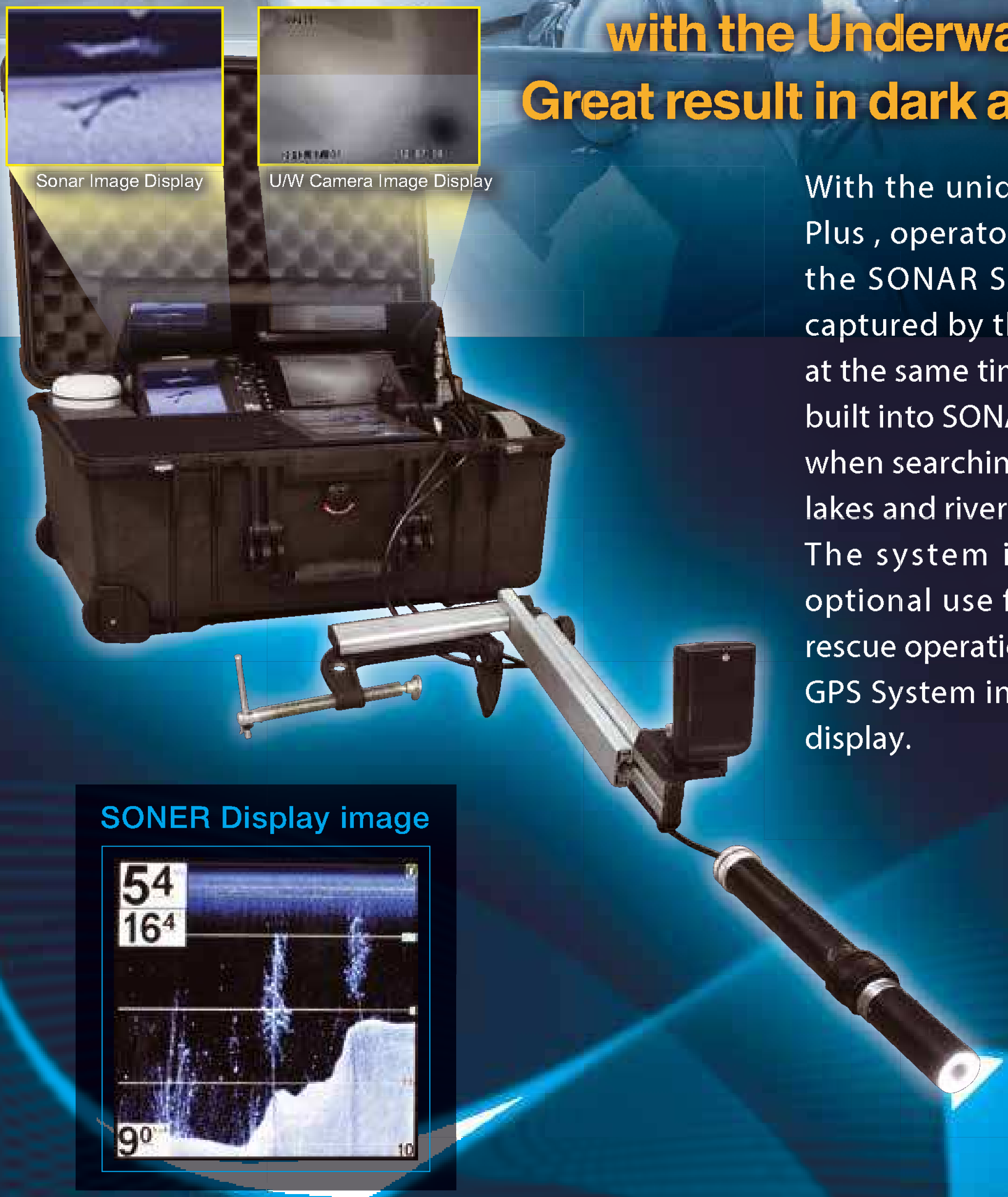
3M Fire Protection Products

YONE PROEYE 751-SNR

SONAR Plus ™

PAT.P

Search out by SONAR and pinpoint with the Underwater Camera Head!
Great result in dark and cloudy waters!


Sonar Image Display

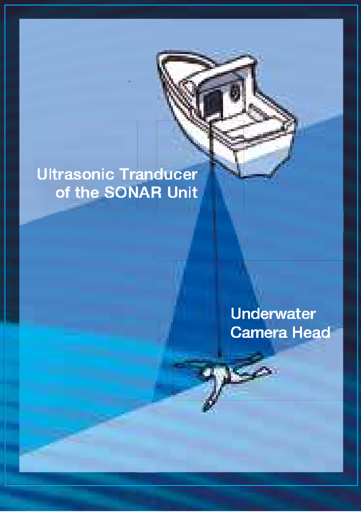
U/W Camera Image Display

SONER Display image

With the unique PROEYE 751-SNR SONAR Plus , operators can see sonar images from the SONAR System and real-life images captured by the Underwater Camera Head at the same time. The forefront technologies built into SONAR provides clear images even when searching the dark or cloudy waters of lakes and rivers.

The system is designed compactly for optional use for various types of search & rescue operations.

GPS System indicates exact location on the display.



YONE CORPORATION
www.yone-co.co.jp

23, Nishinakaaicho, Nishinokyo, Nakagyo-Ku, Kyoto, 604-8441 Japan
Tel : +81 75 821 1185 / Fax : +81 75 801 2263

What if a Large Earthquake Hit?

Earthquakes pose a major risk across Asia and recent events have demonstrated their power to take lives, destroy buildings and disrupt societal functioning. In what follows we outline a methodology for building realistic earthquake disaster scenarios for major cities using Adelaide, Australia, as a case study. We analyse an earthquake of magnitude 6.0 occurring on the Para fault, which runs underneath Adelaide's CBD.

Valentina Koschatzky

Valentina Koschatzky is a Catasrophe Risk Scientist at Risk Frontiers, a natural hazard research centre based at Macquarie University in Sydney.

This study is part of a broader research programme from Risk Frontiers and the Bushfire & Natural Hazard Cooperative Research Centre (CRC). It seeks to deliver a suite of scenario simulations that investigate realistic disaster scenarios, scenarios that lie well beyond the emergency managers' recent experience. They aim to help emergency managers stress test their operations by revealing blind spots and vulnerabilities in their strategic planning.

Historical experience

Despite its low seismic activity, Australia is more vulnerable to earthquakes than one would expect by virtue of its concentration of population and the value of its building stock, much of which is structurally unable to withstand even moderate seismic shaking. The 1989 M5.6 Newcastle earthquake rates as one of the costliest natural disasters in Australia, despite its low magnitude. Its epicentre was close to the city's CBD.

An important question arising from the Newcastle event is: what would happen if one of Australia's more populous cities were struck by an earthquake similar to the Newcastle event?

The 1954 M5.6 Adelaide earthquake affords an example of a close call. Until the Newcastle event, this was the most destructive earthquake to have hit Australia. Its epicentre lay far from developed areas at the time, but today, with the growth of the city, would now lie within densely developed areas.

No lives were lost in the 1954 earthquake and there were only three recorded injuries. Many houses were cracked and heavy pieces of masonry fell from parapets and tall buildings in the city. One of the settlement's earliest buildings, the Victoria Hotel, partially collapsed. Other major buildings that were severely damaged included the local church, St Francis Xavier Cathedral, the Adelaide Post Office clock tower and a newly completed hospital in Blackwood, which sustained major damage to its wards and offices. The Britannia statue in Pirie Street, Adelaide was badly damaged, and since it had also been similarly damaged in the 1897 Beachport and 1902 Warooka earthquakes, the clock in the statue was permanently removed. The Troubridge Island Lighthouse off the southeast corner of Yorke Peninsula shut down after the quake damaged its generator while the Cape St. Auburns Lighthouse on Kangaroo Island began flashing irregularly.

Methodology

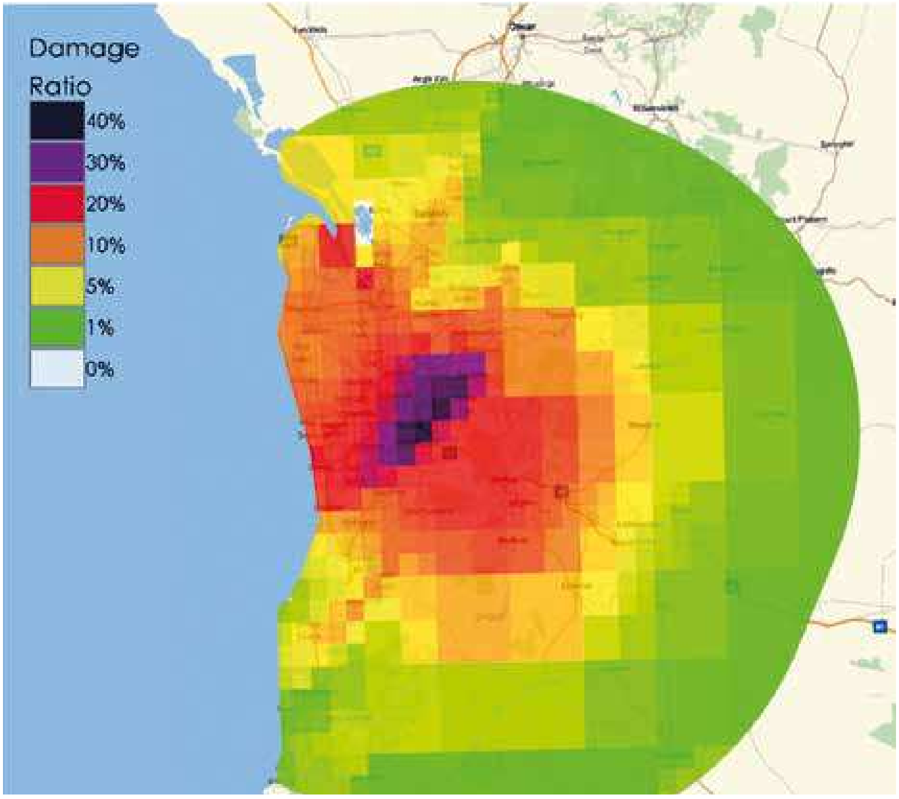
In order to develop a scenario we employ a suite of models that consider risk a function of:

- Hazard: in the case of earthquake, this describes how seismic waves cause ground motions in locations away from the fault as a function of its magnitude and distance from the epicentre
- Vulnerability: how buildings are impacted by seismic ground motions
- Exposure: where buildings are located and whether or not they are occupied at the time of the event.

What is special about this exercise?

Hazard Modelling

Most earthquake loss models tend to use a single-variable such as peak ground acceleration (PGA) to estimate damage. PGA corresponds to the lateral impulsive force exerted by ground motions on a building; however, damage is also a function of how quickly or slowly that force is applied, which is in turn related to the distance from the source and local soil conditions as well



◀ **Figure 1: Residential Damage: destruction as a percentage of Replacement Value of the local Building Stock.**

▼ **Table 1: Number of Home Equivalents Destroyed.**

Line of Business	Number of Addresses
Residential	88,440
Commercial	4,815
Industrial	1,650

as a building's construction details and its height. For example, low frequency ground motions of 1sec period will affect a 10 storeys building more than shorter buildings which will respond more to high frequency ground motions. This modelling exercise takes all of this into consideration by using a multi-parameter vulnerability model, which corresponds to the full response spectrum of the ground motion – this is the only earthquake loss model of its kind.

■ Exposure Modelling

Another important feature of our modelling is high-resolution exposure information using the Geocoded National Address File (G-NAF). For construction categories we used the National Exposure Information System (NEXIS) from Geoscience Australia. This exercise also requires information on soil types, location of essential facilities and population from a number of sources (ABS, Roadnet and Risk Frontiers' in-house information)

Results

■ Buildings

A large number of buildings are expected to sustain severe damage: Figure 1 shows the extent of the damage to residential addresses while Table 1 summarises the Numbers of Home Equivalents Destroyed (Sum of the damage ratios) for the whole area. For example if 10 buildings are each 10 % destroyed, this is equivalent to one Home Equivalent destroyed. It is assumed that a building is located at each address.

■ People

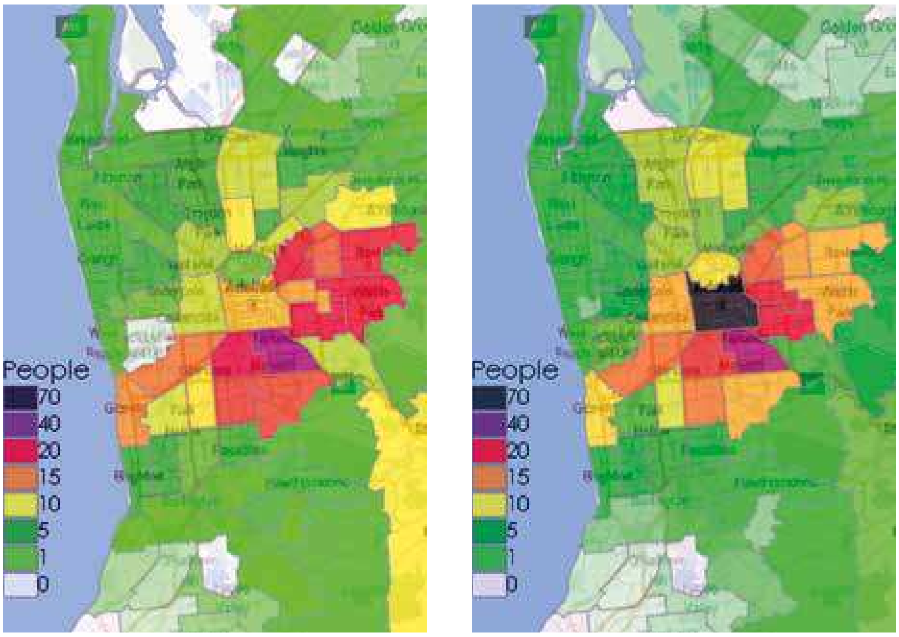
An earthquake can occur at any time of the day and this is important when estimating casualties. For this exercise we have modelled an event that occurred at night when most people are at home and another during a regular working day. Maps below show the distribution of casualties under each of these scenarios. The damage state probabilities for the building stock are used in conjunction with the estimated population distribution to calculate casualties. Figure 2 shows the median spatial distribution of severe injuries and deaths.

We have also modelled damage and disruption to infrastructure and essential facilities – hospitals, schools and emergency services facilities.

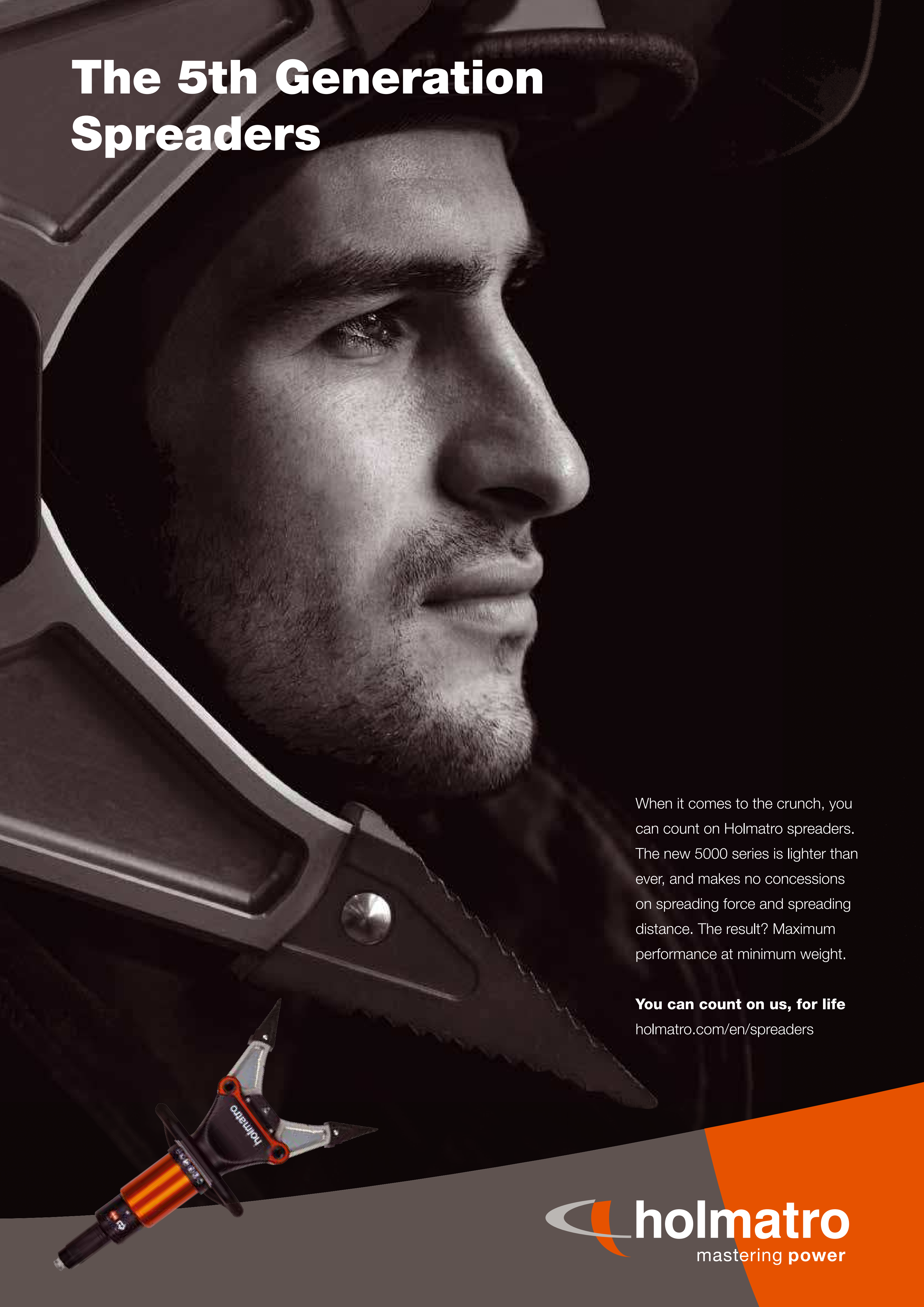
The analysis portrays a potentially devastating scenario for the population and the economy of Adelaide. It serves as a tool for emergency managers to examine a plausible event that is well beyond recent experience and help them plan for such an occasion.

For more information, go to www.bnhcrc.com.au/research/economics-policy-and-decision-making/234

▼ **Figure 2: Numbers of severe injuries and deaths. Night Time (left figure) and Day Time (right figure, whit the black CBD).**



Images courtesy of Andrew Gissing



The 5th Generation Spreaders

When it comes to the crunch, you can count on Holmatro spreaders. The new 5000 series is lighter than ever, and makes no concessions on spreading force and spreading distance. The result? Maximum performance at minimum weight.

You can count on us, for life
holmatro.com/en/spreaders

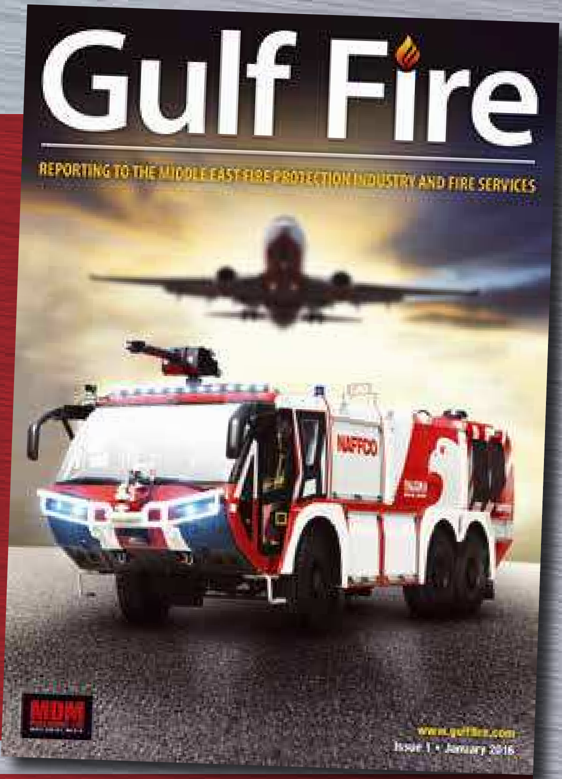
holmatro
mastering **power**

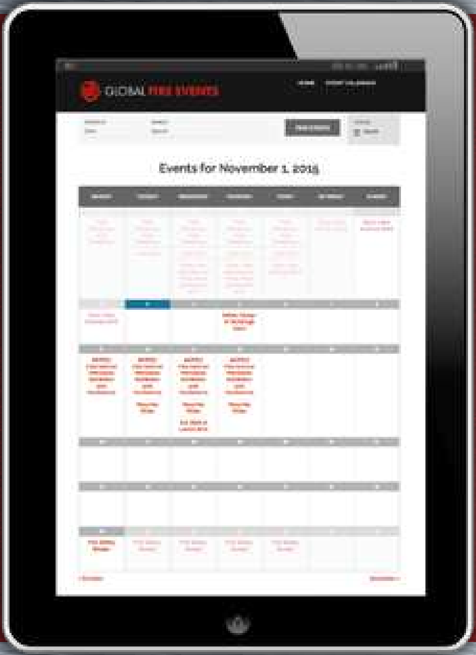
FREE Subscription

Gulf Fire

Gulf Fire Magazine is the only quarterly journal specific to the Middle East Fire market dedicated to both fire protection and firefighting. The editorial features are written by industry experts and comprise a unique blend focussing on the latest technology, training methods and equipment as well as highlighting sector specific issues from around the region. Regular product and company profiles, events updates and news make Gulf Fire Magazine the first choice read for fire protection and firefighting professionals.

www.gulffire.com


Gulf Fire
REPORTING TO THE MIDDLE EAST FIRE PROTECTION INDUSTRY AND FIRE SERVICES
NAFFCO
MDM
www.gulffire.com
Issue 1 • January 2016



GLOBAL FIRE EVENTS

Global Fire Events is an events website like no other, it sets itself apart from the competition by putting you in control. The site allows you to upload your fire related events at no cost and to share with the world – anything from a fire station open day, media launch, charity event or a major trade show, Global Fire Events gives you the flexibility. Basic listings are free and you are able to enhance the entry by taking options at a small additional cost. Check out Global Fire Events to see how simple it is to interact with the information and please feel free to share your event with us and the world.

www.globalfireevents.com

GLOBAL FIRE DIRECTORY

Global Fire Directory is a comprehensive global resource for finding people and products in the fire and rescue industry. Please browse the sections for organisation data, suppliers and manufacturers in the sector or simply type what you're looking for into the search bar. Basic listings in Global Fire Directory are free and you have options available to upgrade your information depending on your budget. Global Fire Directory is set to become the one stop repository for all information relating to the world of fire protection, fire safety and fire and rescue. Check out Global Fire Directory to see how simple it is to interact with the information and please feel free to share your details with us and the world.

www.globalfiredirectory.com

MDM PUBLISHING LTD
WORLDWIDE MEDIA

Come and see us at intersec Stand 6-E38

Taking the Heat Out of Ship Fires

On-board a commercial ship, fire can swiftly lead to catastrophic consequences for the lives aboard, the ship, its cargo and the environment surrounding it. Fire is a destructive force that requires a broad range of knowledge and skill to overcome. Accurately recognising the type and extent of a problem is the first step in formulating a sound plan to deal with it. Making the best use of resources and techniques to limit damage and efficiently extinguish a fire is the ultimate goal.

Ian Gabites

Ian Gabites is an Associate Lecturer for the Emergency Response Centre (ERC) at the Australian Maritime College (AMC), a specialist institute of University of Tasmania (UTAS). Ian joined the ERC team 5 years ago. He has 21 years' experience as a volunteer firefighter and casual training instructor with the Tasmania Fire Service (TFS).

In recent times, a number of fire agencies within Australia have taken a proactive role in refreshing their skills and knowledge in marine firefighting due to the associated risks associated with an ever increasing number of vessel movements through our ports.

While there are many parallels between responding to large structure fires and ship fires, fighting fires on-board commercial vessels introduces some challenges that require different techniques and principles to be employed for the best outcome to be achieved. One of those techniques is 'boundary cooling' and it seems that every mariner and firefighter has a slightly different view on the concept.

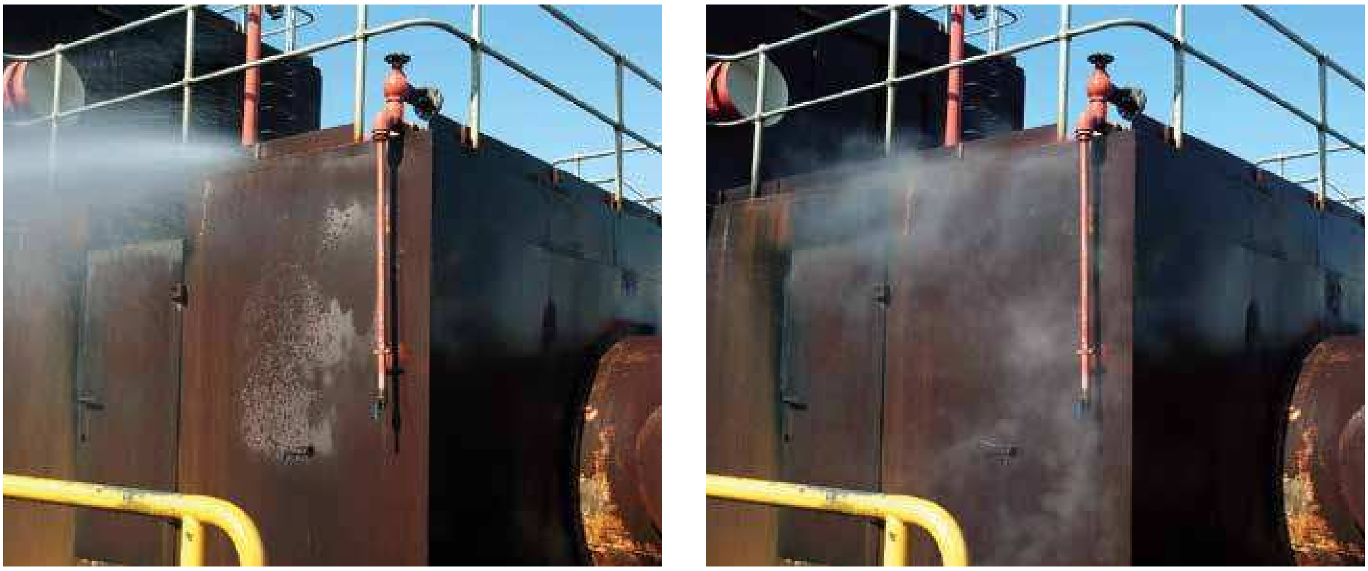
Almost every marine firefighting reference book will briefly explain one of two possible types of boundary cooling, for example: Robert j Brady Co. Marine Fire Prevention, Firefighting & Fire Safety book, endorses the use of water fog to prevent the spread of conducted heat while the Navel Handbook for Ship Firefighters (2006) in 0414, point f. prescribes "Applying the minimum amount of water to keep the boundary damp, removing bulkhead linings if required." In addition, trolling through YouTube footage of actual ship fires and you will find plenty of examples of fire attack parties deluging huge quantities of water onto fire boundaries. So, why is there such a discrepancy?

I believe part of the problem is that the term 'boundary cooling' is a generic term for applying water to a ships bulkheads containing the fire but, that boundary cooling can be used to achieve two opposite results.

To help clarify the difference I have termed the two styles as defensive and offensive boundary cooling which are explained below.

▼ Lots of water slows or stops heat escaping, containing the fire but, water run-off must be managed.

Image courtesy of Ian Gabites



Images courtesy of Ian Gabites

▲ **After initial wet down, concentrate light water sprays onto dry metal only.**

Defensive Boundary cooling (Heavy application of water).

Traditional boundary cooling typically requires copious quantities of water to be applied onto bulkheads or hull plate boundaries of a fire. This is to prevent or reduce heat from escaping the space on fire by protecting exposures and halting the spread of fire.

The principle

Ensuring that surrounding bulkheads around, above and below the compartment on fire are kept cold so that little or no heat can escape. This method effectively insulates the boundaries of the fire by keeping the heat energy contained within the affected compartment thereby stopping the possibility of heat causing fire in adjacent compartments. This is very easy to achieve if plenty of water is available. The choice of nozzle or water pattern has little impact on the ability to successfully use this technique.

On the face of it, this is a sound strategy as there is no argument to discount the fact that that if heat cannot escape then fire cannot exist beyond the boundary of decks and bulkheads containing it but, there are some side issues to manage when this method is employed.

Image courtesy of Richard Serong

▼ **Effective Boundary cooling in action.**

Considerations

The first consideration is the weight of water being introduced to the vessel and stability. With anywhere between 200 and 700 kilos of water delivered every minute from each line of hose, stability of the ship will need to be addressed within a very short time due to sheer weight or the free surface destabilising effect of water, especially above the waterline. Is the boundary cooling water being drained or pumped off the vessel quickly enough? Are firefighting activities currently or likely to affect the stability of the vessel? Is the amount of water being used really necessary to achieve the required result?

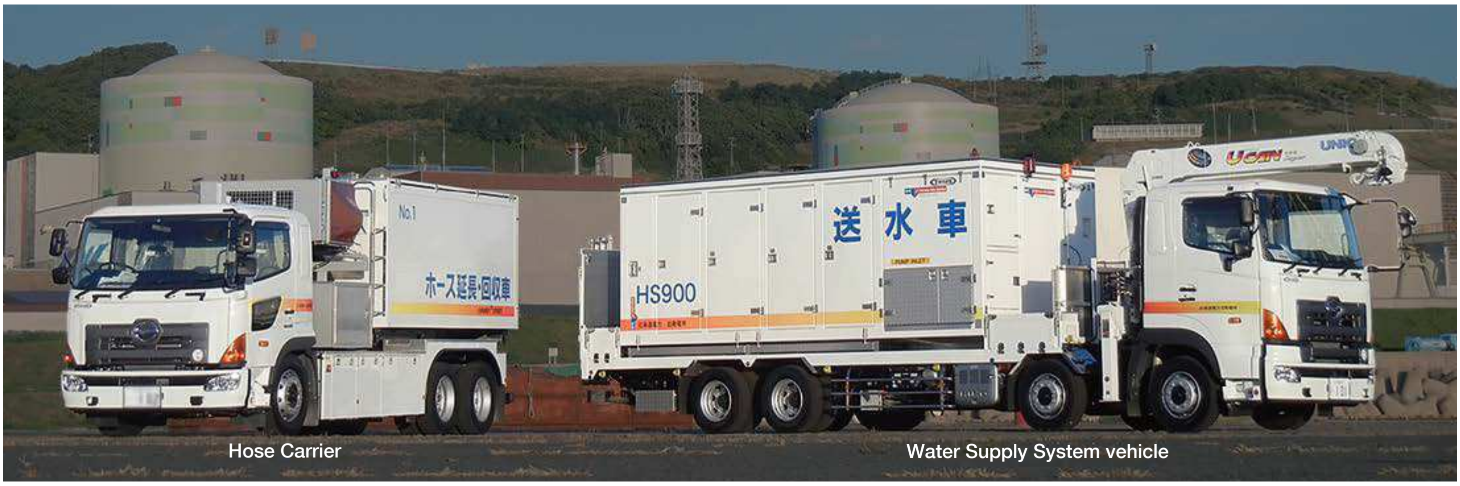
The next consideration is that, by keeping the bulkhead material cold any heat inside the fire affected space will increase significantly making direct attack techniques riskier for fire attack teams.

By the same token however, if there is no intention of a direct fire attack then this method is ideal to help contain the fire as much as possible.

Offensive boundary cooling (Light application of water).

Although the origin of this method of boundary cooling is unclear it has been successfully used for many years with great effect. I have called this variation “offensive boundary cooling” as it assists in cooling the inside temperature of a compartment on fire thereby allowing entry by a direct fire attack team more quickly and more safely than would be the case otherwise. Just like adding another iron to the golf bag, this is a different technique that we can call upon when the need or opportunity requires it.

TEISEN'S Large Volume Water Supply System



The Long Distance Large Volume Water Supply System vehicles (Hydrosub System vehicles) can supply water at up to 30,000L/ min. over long distances for fire extinguishing in the event of disasters, oil tank fires or forest fires and can also be used for emergency cooling of nuclear power plants.

The Long Distance Large Volume Water Supply System vehicle and Hose Carrier further meet the following terrorism and severe accident measures in the current nuclear regulations set by Japan's Nuclear Regulation Authority (NRA)

■Cases corresponding to prevention of nuclear disasters:

●Response to intentional aircraft crashes
●Suppression of radioactive material dispersal
●Prevention of Containment Vessel failure & large release
●Prevention of core damage (Postulate multiple failures)

Over 80 sets of these products have been supplied to nuclear power plants.

■Water Supply System vehicle

Hydrosub Model		＊HS150	HS550(F)	HS900(F)	HS1200(F)
Water volume	L/min.	3,000	14,000	20,000	30,000
Water release pressure	MPa	1.2	1.2	1.2	1.2
Water intake depth	M	60	15	15	15
Vehicle dimensions	M(L×W×H)	8.0×2.5×3.5	12.0×2.5×3.5	12.0×2.5×3.5	12.0×2.5×3.5
Vehicle weight	Kg	15,000	22,000	24,000	25,000

● (F) includes foam mixer (option)　＊HS150 is a container model.

■Hose Carrier (with detachable hose container)

Hose Recovery Unit Model		HRU200 (for 150 ～ 200MM hose diameters)	HRU300 (for 250 ～ 300MM hose diameters)
Hose load	M	1,000 ～ 1,800M	400 ～ 600M
Vehicle dimensions	M(L×W×H)	7.8×2.5×3.8	8.4×2.5×3.3
Vehicle weight (hose not included)	Kg	12,100	14,300

Teisen
TEIKOKU SEN-I CO., LTD.
7F-Yanagiya-Bild, 1-10, 2-chome, Nihonbashi, Chuo-ku, Tokyo 103-0027, Japan
TEL: (81) 3-3281-3031 FAX: (81) 3-3274-6397
E-mail: teisen-tyo@teisen.co.jp **URL: http://www.teisen.co.jp**

Image courtesy of Ian Gabites

◀ Steam is heat being transferred to the atmosphere.

Image courtesy of Richard Serong

The principle

Smaller quantities of water are applied as a light spray onto hot bulk heads which will boil or steam off where enough heat is present. Turning water into steam requires a tremendous amount of heat energy to change from its liquid state into vapour or steam.

A common high school science equation states that to raise the temperature of 1 gram of water by 1° Fahrenheit, requires 1 thermal calorie of energy but, to change water into steam requires an additional spike of 540 thermal calories for every single gram of water! The only source of energy is heat and the source of heat is by large coming from the fire itself.

In other words steam on the outside equals less heat energy on the inside.

With this principle in mind, the aim is to produce as much steam as possible and to limit the amount of water reaching the deck as much as is practicable. The result will show a relatively rapid reduction of heat energy within the fire affected space as heat is continually drawn through the bulkhead and dissipated into the outside atmosphere as steam.

Practical application

During the initial stages of a fires growth there may be enough energy available for heavy sprays of water to be effective but, remember that the point of this tactic is to create steam. If water is flowing off and onto the deck simply reduce the flow of water or completely stop applying water until the bulkhead metal dries! Only then should another light covering of water be reapplied. More water will only serve to insulate the bulkhead material as in the defensive boundary cooling method discussed earlier.

For this method, a nozzle capable of delivering smaller quantities of water is best suited and a simple jet/spray nozzle will facilitate this very easily whereby lever action nozzles or branches will need tighter controls on technique to achieve the same result. Short bursts or pulses of water mist are the most appropriate way to apply water with lever action nozzles.

Considerations

From a safety perspective it is sensible to acknowledge that anyone undertaking this method of boundary cooling will be exposed to a lot of steam, especially for the first few minutes of activity. Above deck this will have a negligent impact on firefighters wearing minimum PPE but crews should remain vigilant to avoid steam burns. The same operation below deck may require a much more cautious approach and higher levels of protection. Tactical ventilation around the fire affected compartment should be considered to dissipate the steam produced and SCBA may be required.

Conclusion

Having introduced the difference between both styles of boundary cooling it is important to consider the surfaces to be cooled. Metals are generally good conductors of heat and it is this quality that introduces the ability to boundary cool in the first place. Some bulkhead linings will limit conduction by design in the case of fire resistant divisions or by accident where decorative linings have been installed. Unless heat is coming through a bulkhead or deck there is no advantage in boundary cooling at all. Remove external bulkhead and deck linings to gain access to the metal underneath if possible then monitor for heat and manage it using defensive or offensive boundary cooling as the need requires.

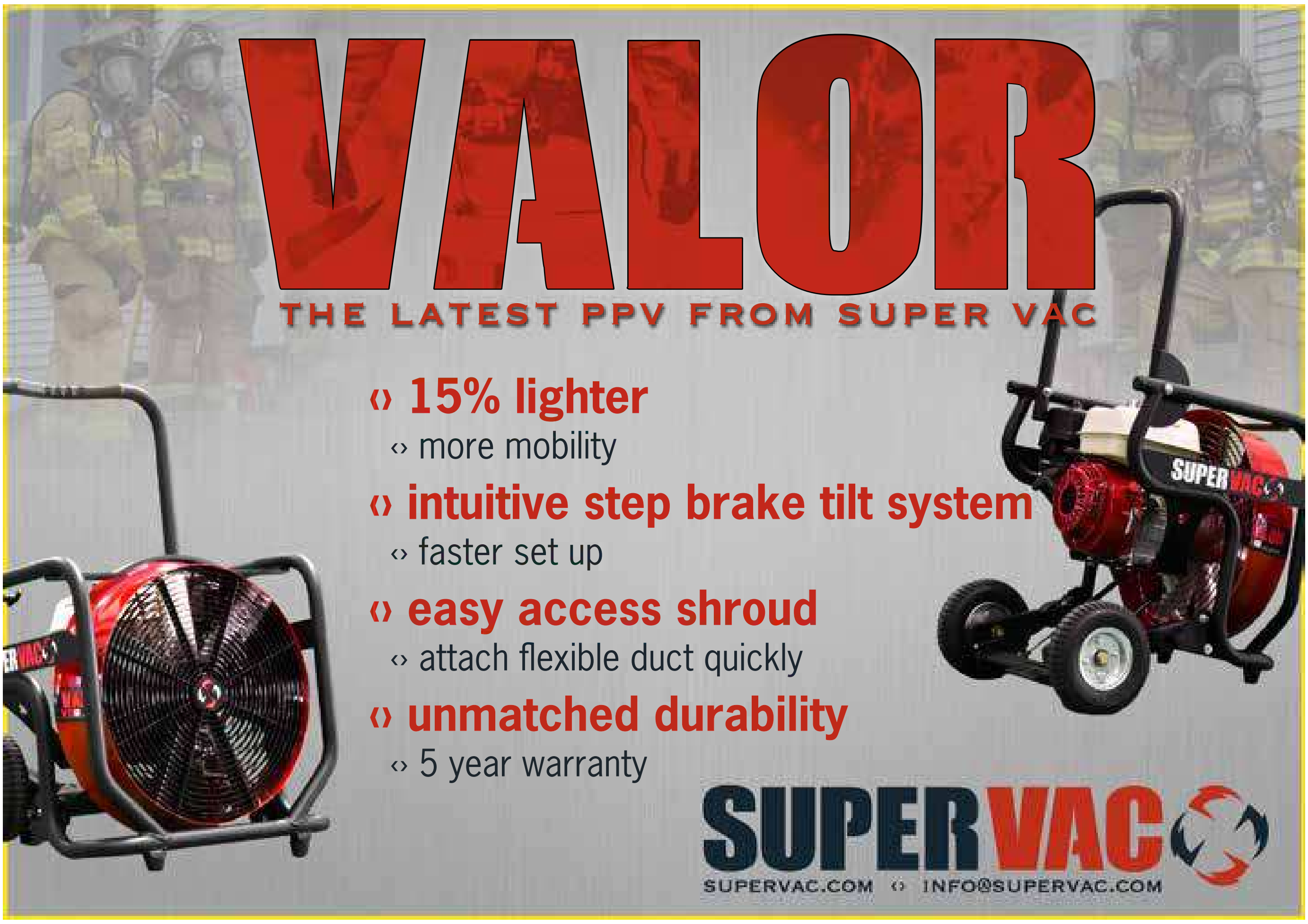
Remember

Defensive boundary cooling: More water, less steam = cold bulkheads and insulated fire boundaries, stops the spread of fire. Temperature within the fire affected space is not reduced.

Offensive boundary cooling: Less water, more steam = cooler temperatures within the fire affected space, facilitates entry by a hose attack team sooner by reducing the inside temperature.

Use one or the other, or a combination to achieve the best tactical and safest outcome.

For more information, go to www.amc.edu.au


VALOR
THE LATEST PPV FROM SUPER VAC

‹› 15% lighter
‹› more mobility
‹› intuitive step brake tilt system
‹› faster set up
‹› easy access shroud
‹› attach flexible duct quickly
‹› unmatched durability
‹› 5 year warranty

SUPERVAC
SUPERVAC.COM ‹› INFO@SUPERVAC.COM

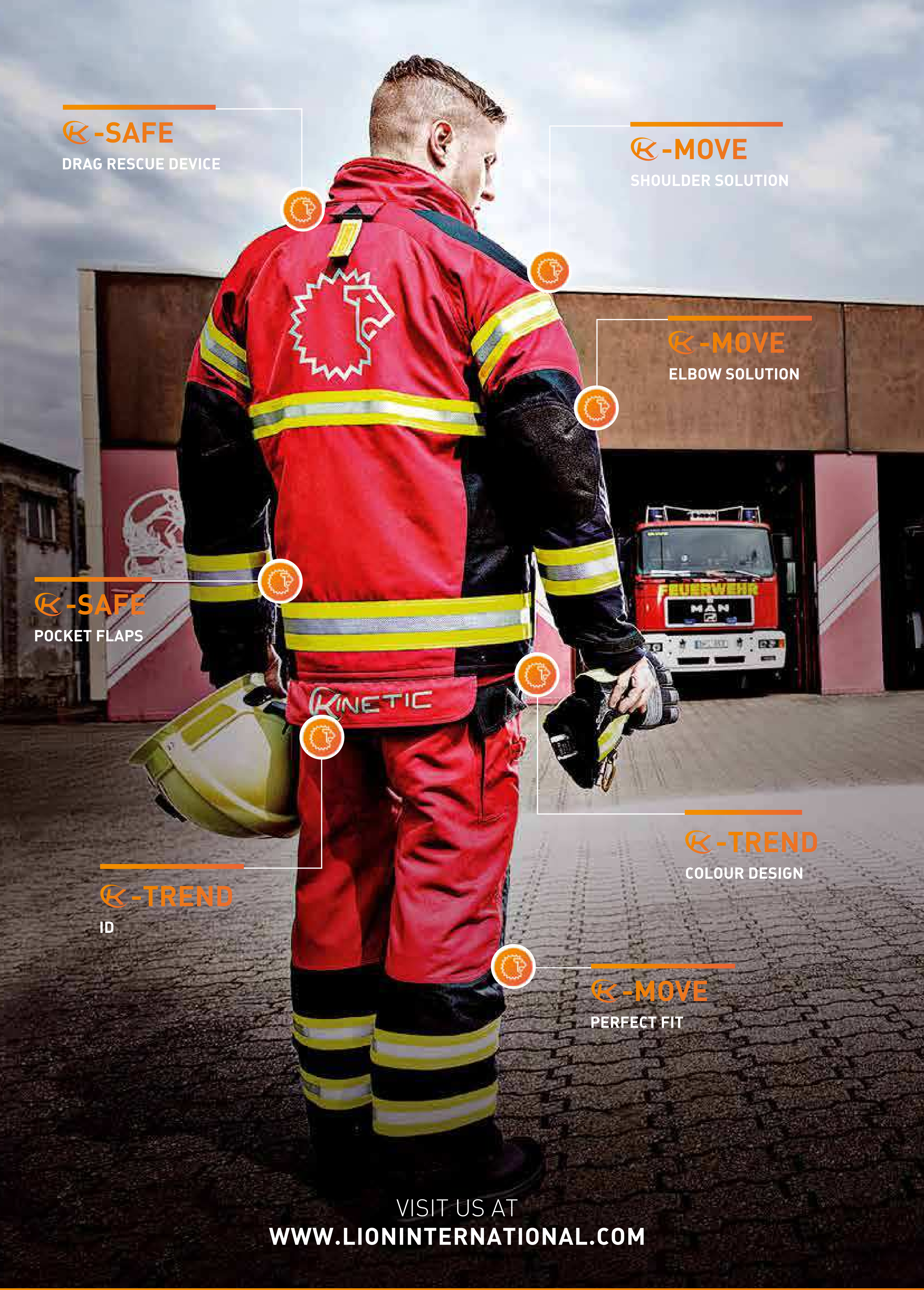
ZIAMATIC MOUNTING SOLUTIONS

Field Tested. Field Proven.

Hand Tools
Struts
Ladders
Nozzles
Chainsaws
Safety Cans
Generators
Couplings
Hard Sleeves
Extrication Tools
and so much more!

Zico
Ziamatic Corp

1-800-711-FIRE | ziamatic.com



K-SAFE
DRAG RESCUE DEVICE

K-MOVE
SHOULDER SOLUTION

K-MOVE
ELBOW SOLUTION

K-SAFE
POCKET FLAPS

K-TREND
COLOUR DESIGN

K-TREND
ID

K-MOVE
PERFECT FIT

VISIT US AT
WWW.LIONINTERNATIONAL.COM

KINETIC

K-SAFE

New integrated safety and rescue components

K-MOVE

Ergonomic functional design combined with innovative materials

K-TREND

State of the art features in shape, colour and individual customer variations

K-SAFE

POCKET SYSTEM

K-SAFE

HAND PROTECTION

K-TREND

COLOUR IMAGES

K-MOVE

KNEE SOLUTION

Available in several outershells and moisture barriers.

LHD GROUP HONG KONG LTD.
Unit 1003-1004 . 10/F . Block 3
Tins' Center . No.3 Hung Cheung Road
Tuen Mun . N.T. . Hong Kong
P (+852) 2463 2982 . F (+852) 2463 2770
daniel.vonchamier@lhd-group.com

LHD GROUP AUSTRALIA P/L
Unit 3 . 15 Dunstan Road
Wingfield . South Australia
5013 Australia
P (+61) 8 8139 7777 . F (+61) 8 8139 7788
lhdaustralia@lhd-group.com

LION

What does your Structural Firefighting Gear Protect you Against?

To get the best protection out of your Personal Protective Clothing (PPC), you must first know a little about your chosen PPC and its associated Personal Protective Equipment (PPE) and how that is compatible with your fire services resources and training levels as well as your attack strategies and tactics. In this article we will just focus on the protection offered by your Structural Firefighting Ensemble and in particular the PPC element of that protection.

Mark L. Gribble

Mark L. Gibble is a member of the International Standards Organisation (ISO) and Standards Australia representative for firefighting PPE.

Structural Firefighting for the purpose of PPC, covers all structures, fixed and mobile and includes those "structures" that are "man-made" such as bridges, transportation vehicles and vessels as well as buildings to name just a few. Each discipline of PPE/PPC deserves its own discussion, as the risks across Wildland Firefighting, Haz-Mat and Rescue incidents are varied along with the dynamics of the attack strategies and tactics and often duration and competing priorities of the emergency incident.

In a previous article I spoke of ensembles, being the total body protection and what might be the weakest link in that protective chain.

When you receive your new Structural Firefighting PPC, what is your expectation of its performance and what it protects you against. What is your understanding of what it is made up of and how it will provide the level of protection that you expect? What components provide what protection from what hazards and how do they do that? How does your inspection, cleaning and maintenance program ensure that these components remain "Fit for Purpose" throughout the life of the garment? Some manufacturers even provide a DVD to assist the end-user understand the value and purpose of the components and how to optimize your protection when using their product. While there is an extraordinary amount of science that goes into achieving the perfect balance, it is important to have a basic knowledge of these issues, especially when completing your regular visual inspection and static water penetration test of the moisture barrier in your PPC.

How will your station uniform complement your protection and provide a safe balance during the firefighting activity?

The best place to start in this discussion is with the risk assessment of potential exposure hazards of structural firefighting and how that relates to achieving a physiological balance for the protection of the firefighter.

Just some of the adverse exposure hazards may be;

- Flame impingement,
- Radiant heat,
- Water,
- Chemicals,
- Blood Bourne Pathogens,
- Particulate matter.

For most of the structural firefighting PPC on the market, these are some of the hazards that can be protected against, depending on the components and quality of those components that may be present in your PPC.

In addition to these, there often exists a potential blast and fragment hazard at many structural fires.

Depending on your fire services risk assessment prior to purchase, there is also the possibility to provide some protection from some CBRN Terrorism Agents by complying with the appropriate section of the NFPA Standard 1971 -2013.

When considering the list of hazards above, a combination of components provides the critical balance between protection and meta-bolic heat release for the firefighter. The basic components are often as follows;

- Outer Shell
- Moisture Barrier
- Thermal Barrier
- Inner Liner

Historically these may have been in 4 or more layers and rather bulky. But over the last decade or more, some of these layers are being produced in very light weight materials and combined into only 3 or 2 layers.

The outer shell had protected the "engine room" components of the Moisture Barrier and Thermal Barrier, while the Moisture Barrier protected the Thermal Barrier and therefore the firefighter. While the actual science is far more comprehensive than that, when firefighters are inspecting their turnout gear, it is important to assess these components. There are 4 main benefits of having a removable liner in turn out gear. The ability to easily do that inspection is just one of the advantages of having a removable inner. The primary advantage is the ability to wash the outer shell with the majority of the contaminates on it, separately, so as not to "cross contaminate" by potentially forcing these fireground contaminates into the Moisture/Thermal Barriers.

In terms of repairs and replacements, it is far more cost effective to replace only part of the PPC rather than discard the whole garment. Additionally access to certain areas of the garment will be far easier when performing repairs, therefore a reduction in time and therefore cost. All 4 parts of the garment should be chipped so as to ensure the correct components are reassembled and well aligned when returned to the correct firefighter. This also provides a valuable tracking of the history of the garments and assists in the on going "fit for purpose" assessment.

▼ Washing dirty outer shells separate to the inners,helps to protect against "cross contamination" of components.

Image courtesy of Mark L. Gribble

▲ Be sure to include the inner liner in your visual inspection.

▲ Even when on duty,store gear so it is not a "tripping hazard".

An important element of safety control for structural firefighting, is the ability to ensure that a firefighter does not remove the inner of the PPC. This can be done by designing the collar as part of the inner, and the overpant's suspenders being attached to the inner on one side and the outer on the other.

An option or additional feature is having very brightly coloured warning tabs clearly displayed if the inner has been removed.

Outer Shell:

While the outer shell provides some thermal protection, it also provides some abrasion and tear resistance. Related to the issues of abrasion and tear strength is extended UV exposure. Just like buying a fiberglass boat and leaving it sit out in the sun for years, it will eventually deteriorate. So to for most materials, including natural materials and the inherently fire resistant aramids and para-aramids. Thankfully the old practice of hanging turnout gear along the wall of the fire station is rapidly disappearing for a number of reasons. Apart from filling the gear up with all the diesel emissions which were being forced into the material, the first dozen and the last dozen sets in the row were often exposed to either the morning or afternoon sun. As I travel around the world I still occasionally see turnout gear in the front window of the fire truck, receiving the same UV exposure. The very simple answer to caring for your protective clothing no matter what sort of outer shell you currently have, is to store it out of the UV light, preferably in a separate, dedicated well ventilated room with the correct lighting.

I often get asked about colours of outer shell material in terms of visibility. Visibility is important and when new and still clean and the correct dye shade, lime/yellow may be a slight preference. However if these elements are not guaranteed for very long into the life of a structural firefighting garment, of paramount importance is protective performance of the shell material, and the issue of "post burn strength and flexibility".

Therefore the requirement of the outer shell to simply be a "light colour" so that the end user can see when it is dirty and have it laundered, is the starting criteria. Day and night visibility will still be achieved by florescent and retro-reflective trim respectfully.

The trim needs to be part of the regular inspection regime to ensure that it remains fit for purpose. Often some of the fireground contaminates degrade the performance of the trim even after laundering. At the station the firefighter can simply check the retro-reflective component by simply directing

Image courtesy of Mark L. Gribble

▲ **If blood bourn pathogens are a risk during structural firefighting and rescues, then the correct moisture barrier is also critical.**

a torchlight held adjacent to your eyes and at right angles to the trim, onto the retro-reflective component of the trim, and see if the light is fully reflected back.

It is important to also provide some “post burn strength and flexibility” in the outer shell material, to afford the firefighter time to survive an accidental higher thermal energy exposure without the outer shell becoming brittle and/or falling off the garment. This is critical during and immediately after an exposure while trying to escape to fresh air or a safe zone.

Moisture Barrier:

The moisture barrier is often an unseen component of the structural ensemble, but is a critical component of the firefighters protection. Many firefighters are of the opinion that it is only there to repel water. In fact the moisture barrier plays a critical part in the whole concept of protection from all 6 of the hazards listed above. The very balance between protection and meta-bolic heat release is greatly influenced by the moisture barrier, hence the need to purchase the best possible that is commensurate with your risk assessment and therefore performance requirements. We often hear the comment about the “breathability” of a structural firefighting kit, which infers the passage of air. However this science is about the management of moisture, and the barriers ability to control water droplets from getting in while allowing water vapor to get out.

The moisture barrier plays a role in the thermal protection performance buy preventing water from getting into the air space in the thermal barrier. As we saw in a previous article, if water replaces the air in the thermal barrier it can transmit heat 21 times faster than air. This reduces the effectiveness of the thermal barrier and can quickly become dangerous for the cognitive function of the firefighter as well as increasing the thermal load on the physical function of the firefighter.

While water inside your turnout gear is uncomfortable and weighs a kilogram per litre, it can also be the carrier of chemicals. To protect against this is critical. By applying some ensemble thinking, this is just as critical for the boots and gloves as well.

If blood bourn pathogens are a risk during structural firefighting and rescues, then the correct moisture barrier is also critical.

It is not uncommon to handle bleeding patients at many transportation incidents and some structural fires and rescues. Hence a good understanding of what your PPC is designed to protect you against is important.

Today we are able to achieve the balance between protection from all these hazards and still have good meta-bolic heat release. This is apparent in the test data weather you measure it in Resistance to Evaporative Transfer

(RET) which shows good performance with a lower figure, or Total Heat Loss (THL) which shows good performance with higher figures.

Thermal Barrier:

In recent times the thermal protection was achieved by capturing air in reproduced wadding material. Sometimes the more you washed it the more it would fluff up and provide slightly increased thermal protection. This was often bulky and thick and heavy. For the past decade or so, this component is extremely light weight and thin and in some cases alternate designs in association with the moisture barrier, form air layers between the components as well as in the thermal barrier material.

Inner Liner:

This is the innermost material and is worn against the skin or station uniform or undergarments. It is designed to wick moisture away and is often made from filament yarn and serves towards ensuring that the entire system carries less water and dries more rapidly than any other traditionally oriented concept. They have a higher lubricity, which allows the garment to be a little slippery on the skin and not be pulling against the firefighters movement when wet. It also assists in the donning and doffing. These high-tech firefighter turnout liners helps to deliver high THL values and reduce the risk of water-related burn injuries.

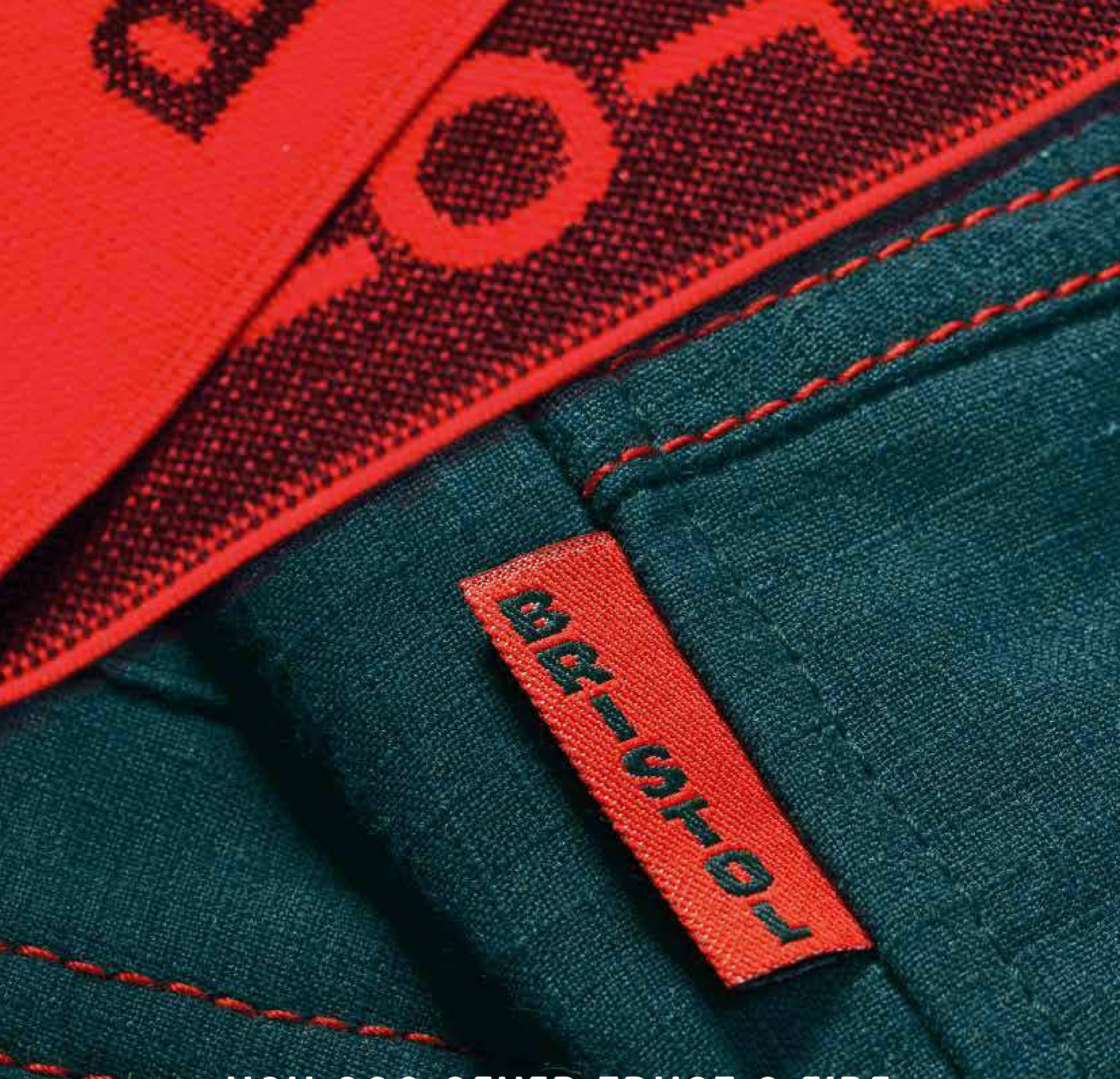
Summary:

In a previous article we touched on the importance of compatibility of PPC. This compatibility can be challenged where agencies might issue new turnout gear on an “as needs” basis with slight variations in components, hence potentially altering the performance of the PPC. Issues of non-compatibility also potentially exist when different agencies work together with different performing components in turnout gear or even within a fire service on the same fireground.

While there is so much more to elaborate on regarding the science in each of these areas and across issues of quality, design, technology and the associated impacts on each of their performance, firefighters will be better equipped to conduct dynamic risk assessments when armed with the content of even this basic knowledge.

Until next time –Stay safe so you may enjoy a long and healthy retirement.

For more information, email markgribble7@bigpond.com



YOU CAN NEVER TRUST A FIRE BUT YOU CAN ALWAYS TRUST BRISTOL

When you're in an extreme or demanding situation, you need equipment that you can depend on and trust to deliver the protection you need.

PPE from Bristol is known around the world for its ultimate performance levels and our Managed Services will give you the reassurance that every garment is at peak condition.

With world-class design, specification and manufacture of an extensive range of PPE, Bristol is the first choice of firefighters in over 110 countries.

To find out more about our products and support services, call us on +44 (0)117 956 3101, email us at enquiries@bristoluniforms.com or visit our web site, www.bristoluniforms.com

BRISTOL

Bristol Uniforms Limited, Wathen Street, Staple Hill, Bristol BS16 5LL, United Kingdom
Telephone: +44 (0)117 956 3101 Facsimile: +44 (0)117 956 5927 email: enquiries@bristoluniforms.com www.bristoluniforms.com

“NEXT GENERATION TECHNOLOGY”

Cutters Edge®
An ISO-9001 Company
FIRE RESCUE SAWS

- More Power... More Torque ... Better Fuel Efficiency
- 75% Less Emissions

The new Dual-Air intake engine technology significantly improves overall cutting performance and meets all Air Quality Control standards at the same time.

MULTI-CUT® Fire Rescue Saw

New 2100 Series includes two engine sizes: 70.7cc and 87.9cc. Each engine is designed for use with Cutters Edge Carbide Tipped BULLET Chain® to cut the widest range of materials found at fireground and rescue scenes.

MULTI-CUT® H Series Rotary Rescue Saw

New H Series Saws are engineered to work harder in the most extreme fire/rescue conditions. The new Dual-Air Intake engine is available in three sizes: 74cc, 94cc and 119cc. Equipped with the Cutters Edge ***Black Diamond Blade*** and now our new carbide-tipped ***BULLETBLADE***® the Cutters Edge H Series Rotary Rescue Saws can cut virtually any material!

CE94 Concrete Cutting Rescue Chainsaw

A new technology 94cc engine and a new style Diamond chain cuts reinforced concrete up to 16-inches thick. Features a lighter weight power head and full-wrap handle for high performance concrete cutting in any position.

All Cutters Edge NEXT GENERATION TECHNOLOGY Fire Rescue Saws are available in fully-equipped Field Kits designed for Rescue Cutting anywhere.

See New Engine Technology Video Now

International Contact:

Tel: +1 541 524-9999 FAX: +1 541 524 9996
Email: info@cuttersedge.com www.cuttersedge.com

Cutters Edge®
An ISO-9001 Company
FIRE RESCUE SAWS
Division of Edge Industries

Risk to our Cities from Catastrophic Volcanic Eruption

The small but persistent eruption of Raung Volcano, Java, had severe economic consequences throughout July and August 2015, impacting the Balinese travel industry and disrupting the international movement of goods and services. The highest eruption plumes reported by the Darwin Volcanic Ash Advisory Centre were only between 4.3 and 5.2 km (22-28 July), but ash drifting in various directions for distances of over 400km resulted in the cancellation of numerous flights.

Christina Magill

Christina's research involves natural hazard risk assessment, probabilistic volcanic hazard modelling and the physical, economic and social impacts of volcanic eruptions and long duration natural hazard events. At Risk Frontiers, she has developed loss calculation models for Japanese and New Zealand volcanoes and Australian hail storms.

The potential for ongoing impacts and disruptions from volcanic eruptions sets these apart from other natural hazard events, such as earthquakes or floods, where recovery may often begin soon after the hazard peak. Volcanic eruptions are also often characterised by multiple hazards occurring at various scales. Intense localised hazards such as pyroclastic flows, lava flows and lahars (volcanic mud flows) may devastate areas near to source and along the volcano's drainage networks. In extreme cases, tsunami may originate from the collapse of an edifice or eruption of material into an ocean or lake.

However, the most common wide-reaching hazard is that of tephra (volcanic ash) fall. Even trace amounts of ash in the atmosphere are enough to restrict flight paths and close airports. Road and rail transport may be affected with less than 1 mm of tephra, which obscures road markings and reduces traction. Human respiratory health is adversely affected and eyes and throats can become irritated. 10 cm of ash can weigh over 150 kg per square meter, with rain further increasing this weight. Accumulation of a few centimetres can lead to building collapse with smaller thicknesses damaging gutters, carports, air conditioning units and furnishings. In large eruptions, climate may be affected for several seasons, primarily due to the injection of ash particles into the troposphere and stratosphere, decreasing the amount of sunlight reaching the earth's surface.

Agriculture is particularly vulnerable to

▼ **Figure 1. Crops destroyed by 10-20 mm tephra fall during the 2011 Shinmoedake eruption, Kyushu, Japan.**

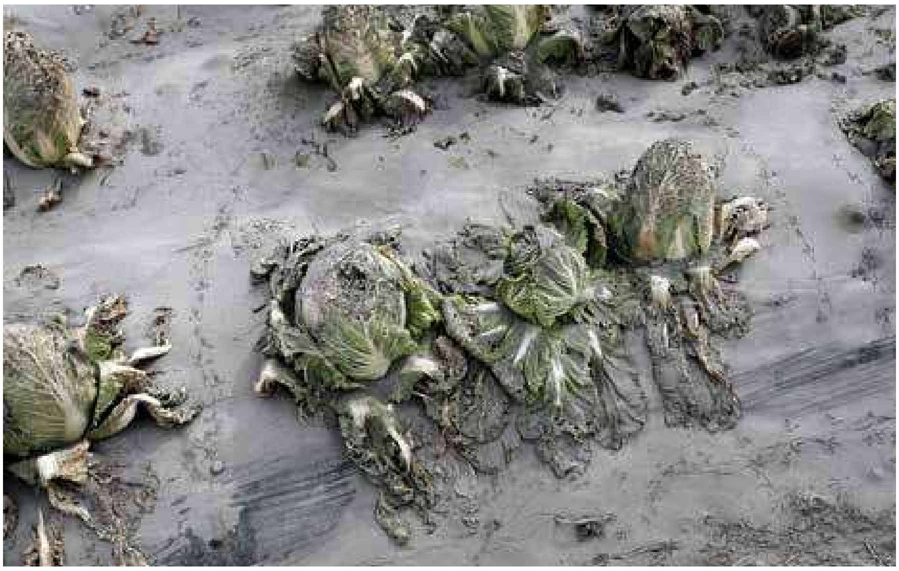
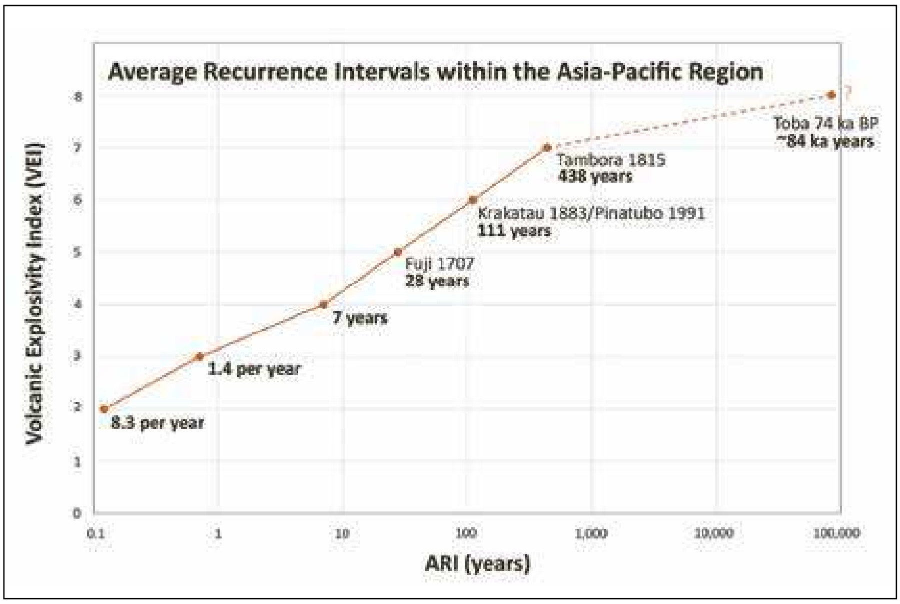


Image courtesy of Christina Magill



◀ **Figure 2. Calculated average recurrence rates for volcanic eruptions in the Asia-Pacific Region. Holocene eruption data from Smithsonian Volcanoes of the World Catalogue (http://volcano.si.edu/). VEI 8 eruptions described in LaMEVE database of large explosive eruptions (Crosweller et al., 2012).**

the physical and chemical effects of tephra fall, which may directly impact crops, soil, animal health, farm infrastructure and machinery (Wilson et al., 2011; Magill et al., 2013). Thicknesses of several centimetres can smother crops, change soil properties and damage greenhouses. Even thin dustings of tephra can adhere to plants, blocking photosynthesis and causing acid damage (Figure 1).

Frequency of volcanic eruptions

Volcanic eruptions are classified by a Volcanic Explosivity Index (VEI), a logarithmic semi-quantitative scale incorporating variables such as eruption volume, plume height and duration (Newhall and Self, 1982). While a VEI 0 or 1 eruption may involve only a gentle effusion of lava, eruptions greater than VEI 2 become progressively more voluminous and explosive. Greater than VEI 5, the volume of erupted material may cause large scale disruption and damage while VEI 7 or 8 eruptions are likely to be truly cataclysmic.

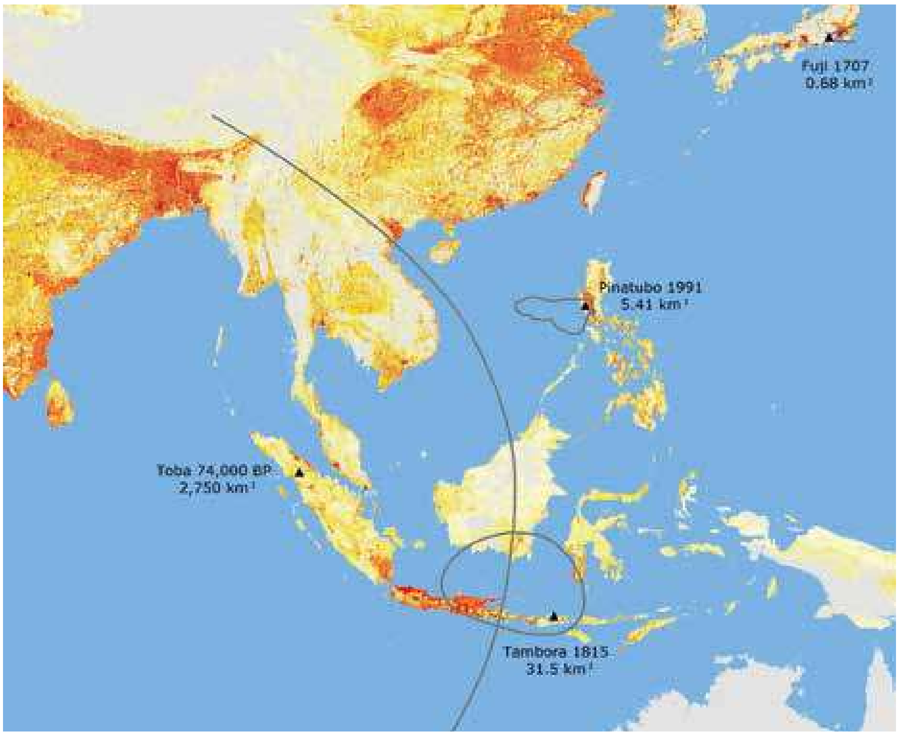
The Smithsonian Volcanoes of the World catalogue (http://volcano.si.edu/) includes available information describing volcanic eruptions that have occurred during the last 10,000 years. Data is more complete for recent times and for larger eruptions, which are more likely to be identified in the geological record or have been recorded in historic documents.

Mead and Magill (2014) calculated the periods for which data is assumed to be complete for the Smithsonian Volcanoes of the World catalogue. This information was then used to calculate Average Recurrence Intervals for each VEI category for the Asia-Pacific region (volcanoes in the Philippines, Indonesia, Japan, Vanuatu, Papua New Guinea, and between New Zealand and Fiji) (Figure 2).

While eruptions greater than or equal to VEI 2 occur on average more than eight times a year, VEI 6 eruptions such as Pinatubo in 1991 or Krakatau in 1883 occur approximately every 110 years. There have only been three VEI 8 eruptions within the Asia-Pacific Region during the past 254 thousand years (one from Toba, Indonesia, and two from the Taupo Volcanic Zone, New Zealand). A much more pressing worry is a VEI 7 event, similar in magnitude to the 1815 Tambora eruption, Indonesia. Eruptions of this size have an average return period of less than 500 years and tens of millions of people would be affected if such an event were to take place within Indonesia, the Philippines or Japan. Unprecedented losses and casualties would result if the eruption was to occur close to a large population centre.

Another large eruption in the Asia-Pacific region

Although it is impossible to predict the location or nature of the next major eruption, it is interesting to consider the consequences of past events assuming they were to reoccur today given modern societal conditions. We are able to analyse the current areas exposed to tephra fall for four previous eruptions in the



© Images courtesy of Christina Magill

◀ **Figure 3. 10 mm tephra fall isopachs for the 1707 Fuji eruption (Miyaji et al., 2011), 1991 Pinatubo eruption (Wiesner et al., 2004), 1815 Tambora eruption (Self et al., 1984) and ~74 ka Toba eruption (numerical simulation by Matthews et al., 2012). Eruption volumes in Dense Rock Equivelent (DRE) from LaMEVE database of large explosive eruptions (Crosweller et al., 2012).**

Eruption	Reference	Eruption volume	Total land area > 10 mm (km^2)	Agricultural area > 10 mm (km^2)	Urban area > 10 mm (km^2)	Population > 10 mm (km^2)
Fuji (1707)	Miyaji et al. (2011)	0.68 km^3	28,730	5,170	1,530	29,440,000
Pinatubo (1991)	Wiesner et al. (2004)	5.41 km^3	120,110	6,280	30	5,126,000
Tambora (1815)	Self et al. (1984)	31.5 km^3	779,190	67,720	950	75,253,000
Toba (74 ka BP)	Matthews et al. (2012)	2,750 km^3	> 32,000,000	> 3,600,000	> 34,000	>1,900,000,000

▲ **Table 1. Estimates of Total, Agricultural and Urban land areas, and population affected if four significant historic eruptions were to occur today. References refer to publication of 10 mm isopachs obtained by geological investigation (Fuji, Pinatubo, Tambora) or numerical simulation (Toba). Land-use data is from GlobCover (http://due.esrin.esa.int/globcover/) and population from LandScanTM (http://web.ornl.gov/sci/landscan/). Eruption volumes are from LaMEVE database of large explosive volcanic eruptions (Crosweller et al., 2012).**

Asia-Pacific region (Figure 3 and Table 1). Tephra dispersal is based solely on environmental conditions at the time of each eruption. The same eruption may have vastly different consequences if wind conditions were varied.

A repeat of the immense Toba eruption, approximately 74,000 years ago would severely impact most of the land area of Indonesia, Malaysia, Singapore, Thailand, Laos, Cambodia, Vietnam, Myanmar, Bangladesh, India and Shi Lanka. Tephra would travel as far as Africa and have severe global consequences. A more credible event to consider however is the eruption of Tambora, two hundred years ago. This is the largest eruption in recorded history with ash 1m thick falling 75 km from the volcano; 11-12,000 people were killed directly, while another ~60,000 died from starvation and disease due to crop failure (Oppenheimer, 2003).

Today more than 75 million people would be affected by more than 10 mm of tephra, enough to decimate crops and severely impact infrastructure and urban systems.

Quantifying volcanic risk in Tokyo

A repeat of the 1707 Hoei eruption from Mount Fuji would see an urban area of over 1,500 km^2, and approximately 30 million people, impacted by more than 10mm of tephra fall. This includes almost the entire area of Kanagawa and Chiba prefectures, the highly populated eastern area of Tokyo prefecture and parts of Shizuoka, Yamanashi and Saitama. Home to Japan's national government, this area is also a major national and international hub for business, manufacturing and transport. A similar eruption today, would disrupt these sectors and severely damage buildings and infrastructure. The clean-up requirements would be immense with assistance and resources having to be sourced from outside the affected area.

Although the most visible, Fuji is not the only threat to Tokyo; the city could be affected by any of a large number of volcanoes, with those immediately to the west posing the greatest hazard. As a first step to quantify the impacts of a future eruption impacting Tokyo, the probabilistic *KazanRisk* model (Figure 4) has been developed. *KazanRisk* contains a catalogue of 60,000 simulated tephra fall events from six volcanic centres, exposure information and mathematical functions relating the magnitude of tephra fall to damage. By assigning probabilities to each event we are able to calculate likely losses to buildings, the costs associated with the cleanup of roads and public areas, and loss of agricultural productivity due to crop damage, effects to livestock and damage to farm equipment. These methodologies may be extended to consider additional impacts, volcanoes and regions.

For more information and detailed references email christina.magill@mq.edu.au

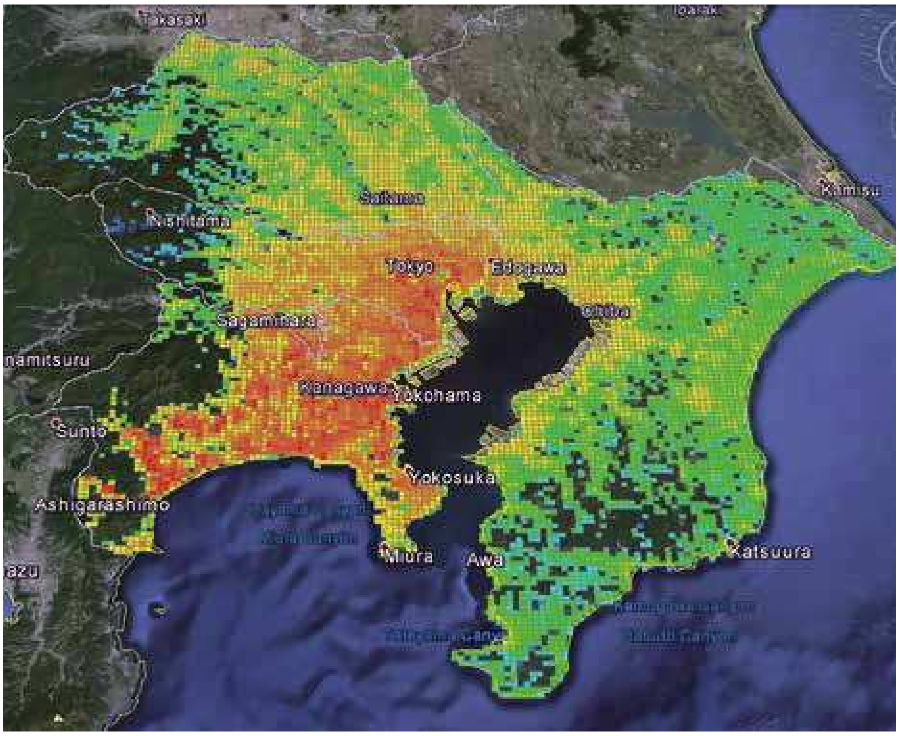


Image courtesy of Christina Magill

◀ **Figure 4. Example of kml map produced by KazanRisk describing building loss on a 1km grid over the Greater Tokyo region, Japan. Map presented on Google Earth base layer.**

Building Product Compliance – Get Ready for Positive Changes

In recent times Fire Protection Association Australia (FPA Australia) has advocated strongly for changes to building product compliance in Australia. High profile incidents such as the Australian Competition and Consumer Commission recall of Infinity Electrical Cable, which can become a fire hazard in as little as two years and was installed in up to 40,000 homes Australia wide, have eroded confidence in the power of existing regulatory regimes to ensure compliance.

Joseph Keller

Matthew Wright

Joseph Keller is Communications Manager, FPA Australia.

Matthew Wright is Chief Technical Officer and Deputy CEO, FPA Australia.

This incident combined with the significant fire at the Lacrosse apartment in Melbourne's docklands precinct, which was fueled by highly flammable cladding installed on the exterior of the building, have led to a major public outcry.

This public awareness has in turn led to two significant government initiatives: A federal senate inquiry into non-conforming building products and an investigation into a risk-based product compliance scheme, agreed to at a joint meeting of state and territory building ministers.

FPA Australia has displayed significant leadership in both of these political arenas in order to drive positive community outcomes.

Senate Inquiry – Non Conforming Building Products

FPA Australia has lodged a strong submission to the Senate inquiry outlining that the issue of non-conforming building products is having a considerable impact on the Australian marketplace.

The submission outlines that non-conforming products are producing five key consequences:

1. Reducing the level of community safety expected to be delivered by products required to operate reliably as individual products and/or as part of holistic safety systems.
2. Preventing an even playing field and reducing incentives for responsible corporate organisations to continue to fund research and appropriate product approvals.

▼ **Non-compliant and potentially flammable "Infinity" cabling has been installed in around 40,000 Australian buildings.**

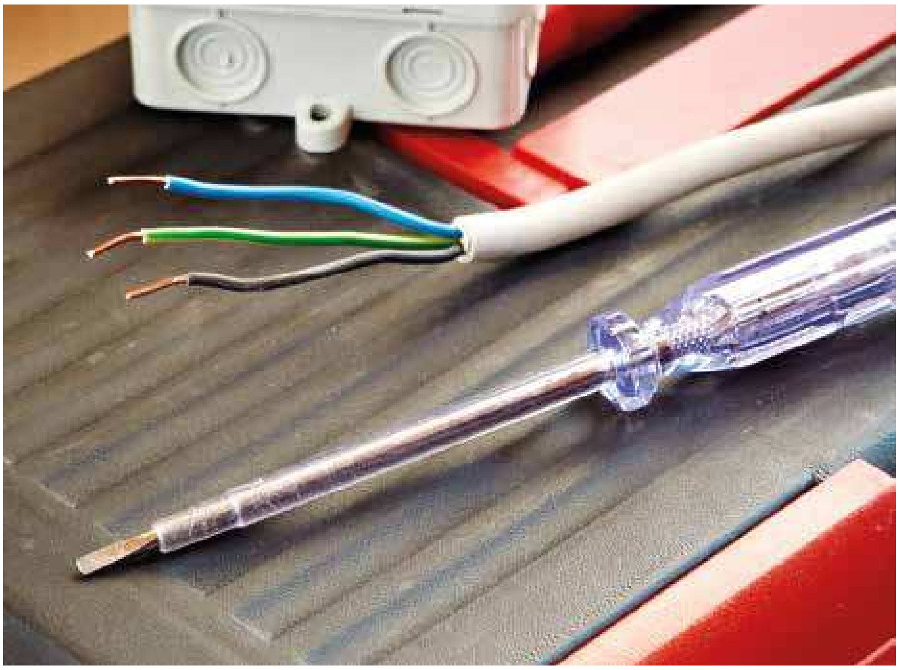


Image courtesy of FPA Australia

3. Increasing costs associated with repair and rectification work when non-conforming products are identified and required to be replaced.
4. Reducing the quality of Australian buildings.
5. Creating uncertainty and reducing confidence in each aspect of the building supply chain.

There is a need for trade flexibility across local and imported products and this is mandated by the World Trade Organisation agreement for Reducing Technical Barriers to Trade, which Australia is a signatory to. However regardless of where a product is manufactured, FPA Australia believes Australia must re-establish clear standards of product performance. This is especially important for products that are required to be installed or incorporated in buildings to achieve safety outcomes.

The lack of clear expectations and education regarding appropriate product selection and use creates a potential increase of litigation of builders, building surveyors, designers and the like by building owners (or contractors) who pay for what they believe is a conforming product, yet obtain non-conforming products. This is not merely speculation. Such a situation is currently occurring as the Lacrosse apartment fire saga drags on, with the builder and building surveyor being investigated by the regulator and owners pursuing a class action lawsuit.

The Australian Industry Group (AIG) has conducted extensive research into the economic impact of non-conforming product. The AIG document "The quest for a level playing field, the non-conforming building product dilemma, 2013" states that "evidence suggests that the market penetration of non-conforming products in several key construction product sectors in Australia may be up to 50%, this is a sobering and alarming statistic."

Non-conforming products are generally cheaper than conforming products as they haven't been tested and certified as being conforming to Australian legislation or Standards and don't necessarily include the more expensive materials and components required to perform reliably to the expected fit-for-purpose performance standard.

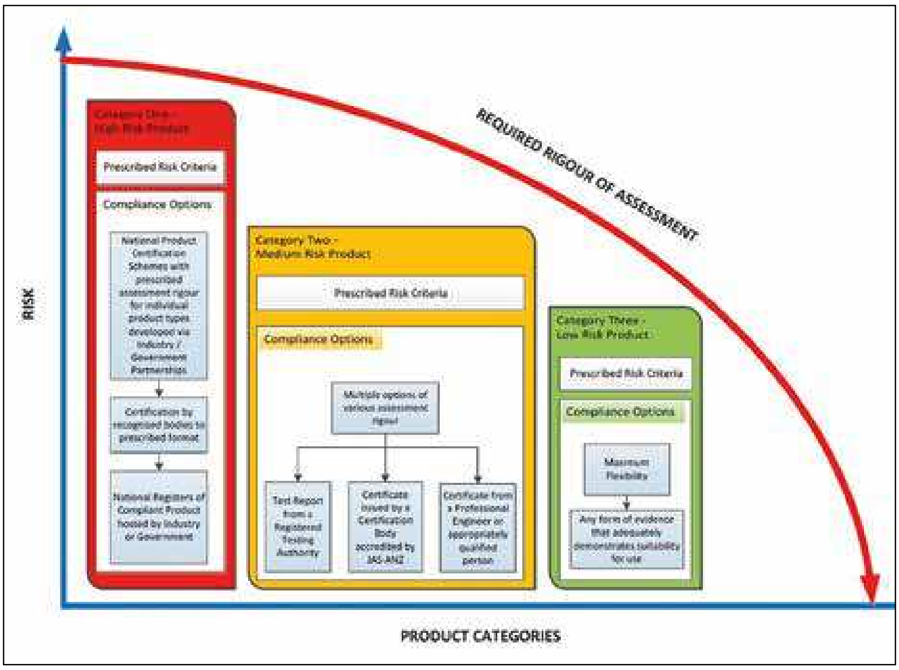

RISK
REQUIRED RIGOUR OF ASSESSMENT
Category One - High Risk Product
Prescribed Risk Criteria
Compliance Options
National Product Certification Schemes with prescribed assessment rigour for individual product types developed via Industry / Government Partnerships
Certification by recognised bodies to prescribed format
National Registers of Compliant Product hosted by Industry or Government
Category Two - Medium Risk Product
Prescribed Risk Criteria
Compliance Options
Multiple options of various assessment rigour
Test Report from a Registered Testing Authority
Certificate issued by a Certification Body accredited by JAS-ANZ
Certificate from a Professional Engineer or appropriately qualified person
Category Three - Low Risk Product
Prescribed Risk Criteria
Compliance Options
Maximum Flexibility
Any form of evidence that adequately demonstrates suitability for use
PRODUCT CATEGORIES

Image courtesy of FPA Australia

▲ **FPA Australia's risk based approach to product compliance has been endorsed at the recent Building Ministers' Forum.**

Cost impacts from non-conforming building products are generally passed on directly or indirectly to owners and occupiers of buildings. An owner or occupier may have to vacate a building for the period of time it takes to rectify the issue created by the non-conforming building product. Rectification can often take months or even years. If a non-conforming product is found in a building, it is often a lengthy and costly process to determine the party responsible and have it rectified. These are costs the Association believes can be avoided and our risk-based approach to product compliance outlined below goes some way to addressing this.

Building Ministers Forum and a risk-based approach to product compliance

In June 2015 FPA Australia wrote to all State and Territory Building Ministers and the Federal Minister for Industry asking them to acknowledge the issue of product compliance and presenting a conceptual framework for the risk categorisation of products and the associated rigour of assessment required to demonstrate they are fit for purpose.

This proved to be a highly worthwhile exercise, with the merits of such a risk-based approach receiving support at the Building Ministers Forum held in late July. The Forum agreed that the federal government will now investigate options for a possible mandatory scheme for high risk building products with life safety implications.

FPA Australia CEO Scott Williams said it was a fantastic outcome but significant work remained.

"This announcement demonstrates that the Building Ministers have listened to the industry and the community and acknowledged the extent of the issue," he said.

"The future establishment of a national register of 'fit-for-purpose' products which are high risk will restore confidence and certainty to the building industry and the community."

"The ABCB will report on the progress of the mandatory scheme for high risk products in six months and we will be supporting the ABCB and working with all stakeholders to ensure that any scheme is sound, robust and rigorous."

In order to understand what is meant by a 'risk-based' approach, it is necessary to examine the current provisions that exist regarding product compliance in the Building Code of Australia (BCA).

Clause A2.2 "Evidence of Suitability" of Volume One of the BCA (replicated by clause 1.2.2 of Volume Two of the BCA) establishes options for manufacturers or suppliers of products to provide different forms of documentary evidence to support a claim that a material, form of construction or design is suitable and fit for purpose.

© Image courtesy of FPA Australia

▲ **Recognition and acceptance of the building product non-conformance problem is an important first step towards a safer industry.**

There is no hierarchy associated with these options. The BCA provides options for different types of evidence that are considered to be acceptable, therefore providing flexibility to product suppliers as to which option they choose to satisfy. The extent to which the documentary evidence of suitability complies with one of these options is ultimately at the discretion of the Authority Having Jurisdiction (AHJ) to accept. Predominately the AHJ is a Building Surveyor (Private or Municipal).

These current requirements represent dramatically different approaches in product assessment rigour to demonstrate fit-for-purpose performance standards are achieved. Accordingly FPA Australia has advocated for change of these requirements based on risk assessment of products. Evidence and identification of non-conformance generally occurs after installation and predominately after a life or health safety incident. For example: the most critical time a fire safety product is required to conform and be suitable is during a fire incident. This is not the time to identify it as being non-conforming and unsuitable.

FPA Australia believes that improvements to the existing regulatory product compliance framework can be made, utilising existing testing and accreditation bodies. While it is always preferred to promote and provide positive outcomes for those companies involved in the manufacture, supply, install and approval process there is also the necessity for a deterrent for those who do not comply with a legislated system or process.

At some stage – or stages – during of the manufacture, supply, installation and approval process there needs to be a deterrent that includes significant financial penalties and a willingness to prosecute, where necessary. Without a deterrent there is little reason to provide a complying building product if there are cheaper alternatives. Failure of a regulator to carry out surveillance and enforce against companies or individuals would result in non-conforming products and practices entering the market.

FPA Australia's proposed solution to address building product non-conformity issues is aligned to the current system and 'Watermark' scheme required by the Plumbing Code of Australia for plumbing products. As such, this proposal is not an entirely new concept. It is enhancing and modifying an existing system to make it suitable for all other building products. It is a system that utilises a risk-based criteria methodology to categorise a building product and thereby apply the appropriate rigour of assessment to address the risk.

It should not be left entirely to the federal government to implement and administer such a new system. Implementation and administration of any such new system should be developed and supported via a partnership between the Federal, State, Territory Governments and the relevant & respective industry bodies.

The procedure would utilise a prescribed risk criteria to categorise the appropriate 'Risk Category' should failure of a product or system result in adverse risk to life safety, health, economic loss and the environment. There would be three risk categories: High, Medium and Low. In addition, a listing of compliant high risk products would need to be accessible.

Product Compliance – The Way Forward

In summary, In order to limit the impact of non-conforming building products to the Australian building industry and consumer, FPA Australia believes that there are a few key factors that need to be accepted and implemented as follows:

1. Recognition and acceptance that Australia has a building product non-conformance problem.
2. Creation of a building product conformance taskforce to develop a National Building Product Compliance System framework and accompanying Regulatory Impact Statement. (This is now underway as a result of the Building Minister's Forum)
3. Modification of legislation where deemed to be ineffective, misunderstood, conflicting or a risk to the Australian people.

As an Association we believe we are closer than ever before to achieving these objectives and helping to restore confidence in the suitability of products in the Australian building and construction marketplace. These are important steps towards achieving our vision of minimising the risk and impact of fire.

For more information, go to www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/Non-conforming_products

FIRETRACE®

POWER TO INNOVATE. FLEXIBILITY TO ADAPT.

WHATEVER THE HAZARD,
WE'VE GOT YOU COVERED

PRE-ENGINEERED SYSTEMS
FOR SMALL SPACES:

- Detect and suppress fires automatically
- Reacts 10x faster than conventional systems
- Compatible with most extinguishing agents

UL LISTED FM APPROVED

Listings and approvals vary by agent and system type

ENGINEERED SYSTEMS
FOR LARGE SPACES:

- High-pressure performance in a low pressure system
- Compatible with "clean" extinguishing agents
- Less piping and greater fill density

LEARN MORE AT: **www.firetrace.com**

A HALMA COMPANY

FIRETRACE INTERNATIONAL - WORLD HEADQUARTERS
8435 N. 90th St., Suite 2, Scottsdale, AZ 85258, USA.
Tel: +1 480 607 1218 • Email: info@firetrace.com

FIRETRACE INTERNATIONAL LTD - EMEA OFFICE
Unit 11, IO Centre, Salbrook Road, Salfords, Surrey, RH1 5DY, UK.
Tel: +44 (0) 1293 780 390 • Email: info@firetrace.com

Inspection App for Automating Fire Equipment Inspections

The popularity of smart phones and tablets has changed the market with an estimated over 120 million monthly global activations of mobile devices at the beginning of 2015. Managing fire and safety inspections has become more efficient with the introduction of mobile devices. Automation enables effective equipment tracking, scheduling, service management, and management of parts and inventories.

Naaman Shibi

Naaman Shibi is Vice-President of Techs4Biz, has over 25 years of experience in the software industry and has worked with a number of large public and private businesses to automate OH&S inspections.

As mobile devices become smarter and more advanced, they are increasingly being used to automate inspections. Mobile devices such as iPhones, iPads, Android smartphones and tablets have been transformed into everyday tools deployed by service organisations such as fire equipment inspectors.

▼ Paperless recording of safety inspections using rugged mobile device.

Image courtesy of Techs4biz

Automating fire equipment inspections using an iPad or Android mobile device

Most smartphones and tablets operate on the iOS (Apple) or Android (Google) operating system, with both platforms capable of handling fire equipment and safety inspection applications. Apps designed for paperless inspections have to provide information that already exists on paper forms and log books. For example, if the inspection involves filling out a weekly sprinkler logbook, the iPad paperless app can fulfil the same function electronically including allowing the fire inspector to select from a list of possible choices, type in information, or use the voice to text function according to the logbook and regulatory requirements.

Paperless fire and safety inspection apps allow the inspector quick access to current, past, and future information. Easy-to-use screens and functions are necessary in the fire inspection apps to enable user-friendly and efficiency operation by the field service personnel. Simplifying navigation buttons and minimising keystrokes will allow fire equipment and safety inspectors to easily and quickly familiarise themselves with the paperless inspection app.

When using the 'appropriate' implementation of a paperless inspection app, the process of collecting inspection and testing data in the field is easy and captures all the required information:

a The Application must be easy to use. As it is used in the field, field inspectors must be able to rapidly 'master' the Application, learn how to navigate to their desired screen/function, and adopt the App as an 'extension' of their business tools/gadgets.

b I am a strong proponent of 'offline mode' field applications, in which inspectors can use their App without being dependent on connectivity. The App is therefore replacing paper forms with a significantly better tool – but without the need for continuous connectivity and increased costs. So, how would an 'offline' App work without the need for connectivity? It's pretty simple. The user can send and receive all the required information, including reference material and pictures wirelessly at any time; but once data is sent or received, users can record all required information directly onto their device while it is 'offline'. Similar to an email client, the field technician control when and how data is sent back to the office. This eliminating dependency on connectivity in remote locations or in areas without connectivity (e.g. basements) and reducing costs since data can also be transmitted using Wi-Fi.

Image courtesy of Techs4biz

▲ **Using Paperless inspection solution app to highlight defects and deficiencies.**

c Barcodes are integrated into the application using the mobile device's built-in camera, which may be very useful to identify the fire equipment. Inspectors can scan fire equipment to quickly access relevant information. The scanner can be used in conjunction with the inspection software to retrieve information such as: last test level performed, last defects identified, next major level as well as the current task (e.g. weekly, monthly etc.) to be performed.

d Picture-taking and integrating the image with the test and inspection results is also essential. Inspectors must be able to snap images and 'doodle' on their pictures as required (e.g. identifying the defect or the non-compliance). In addition, wireless transmission of pictures must be done efficiently and securely without exposing your server to security breaches.

e Simplifying data collection by standardizing functions and drop-down lists is essential. The user must be able to select values from as many drop-down lists as possible, and therefore minimize data entry.

The fire and safety inspection app can include validations that allow or disallow data entry and make data entry mandatory when identifying defects and other non-compliance findings. The fire inspection app can also provide the safety inspector with historical information pertaining to previous inspections and tests.

Mobile device features such as camera, NFC, Wi-Fi, clock and GPS can be integrated with the app to execute multiple functions such as enabling quick identification of equipment, or points of entry and exit, providing audit trail, documenting non-compliance, recording photographic evidence, improving efficiency, and minimising human errors.

Techs4Biz offers Pervidi products, which combine service management, asset management, maintenance management and inspection management functionalities to improve operational efficiencies and reduce costs. Techs4Biz develops and provides technology solutions in 7 languages. Techs4Biz has offices in Australia, Canada and the U.S.

For more information, go to www.Techs4biz.com

Petroleum Storage Tank Facilities – Part 2

In the previous installment we talked about the types of petroleum storage tanks. In this article we will discuss the various types of fires and the fire protection methods available.

Craig H. Shelley
FIFireE, CFPS, Retired Chief

Craig is a 45-year veteran of the fire service. He served with the FDNY for 26 years retiring as the Chief of Marine Operations. Currently, Craig is an Assistant Chief with Industrial Emergency Services (IES) and Manager of Marine Operations. In addition, he is the CEO of World Safe International.

Sue Tarantino
BS, MBA, Retired Battalion Chief

Sue is a retired 27-year veteran of the Charlotte (NC) Fire Department. She is currently a Division Chief with Industrial Emergency Services (IES) and Assistant Manager of Marine Operations. She also serves as a senior fire protection specialist with World Safe International.

In the last article it was mentioned that different types of tanks have various common types of fires. Delving into these fires they can be further identified as follows:

Types of Fires

■ Overfill Ground Fires

Overfill ground, dike, or bund fires result from piping or tank leakage. This may be caused by operator error, equipment or instrumentation failure. These incidents are considered the least severe.[1] When a leak occurs without ignition, all ignition sources should be eliminated and vapors suppressed. Remember that our fire appliances (apparatus) can be the source of ignition. If ignition does occur, the fire is treated as a large pool fire. If valves or piping are leaking, treat these areas as three dimensional fires.

■ Vent Fires

Vent fires are typically associated with fixed roof tanks such as cone roof, covered floating roof tanks, dome roof, vertical low pressure fixed roof, and horizontal tanks. These are less severe fires and can usually be extinguished using a dry chemical extinguisher or reducing the pressure in the tank. Vent fires can be caused by lightning or sometimes hot work in the vicinity.

■ Rim Seal Fires

Rim seal fires comprise the large majority of fires in open top floating roof tanks. As with vent fires, lightning is usually the primary source of ignition. If the seals are not maintained, deterioration may cause fugitive vapor emissions to escape. When these vapors are in the flammable range they can ignite when exposed to an ignition source. There is usually a high rate of extinguishment success if there is no associated damage such as a pontoon explosion or if the suppression efforts do not sink the roof by using excessive water during firefighting.

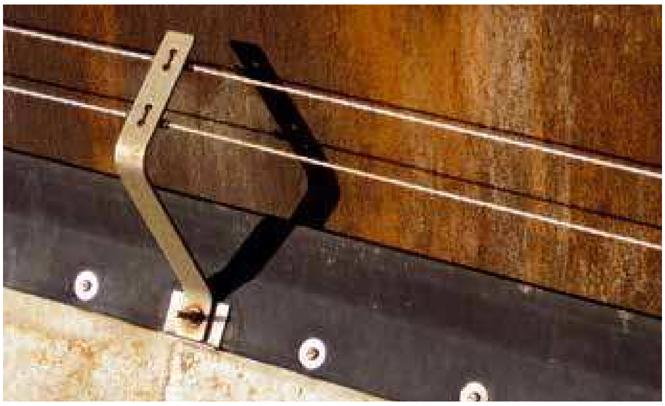
In internal floating roof tanks, rim seal fires may be extremely challenging, especially if there is no permanently attached foam system. With no foam system in place, the only openings to apply foam into the tank would be the small vent openings at the top of the tank. These openings typically have protective screens in them, hampering foam application further. With open top and internal floating roof tanks, fixed or semi-fixed foam systems are the preferred method of extinguishment for rim seal fires.

■ Unobstructed Full Surface Fires

With sufficient resources and trained personnel, unobstructed full surface fires are relatively easy to extinguish on relatively small tanks (less than 45.72 meters [150’]). Larger tanks greater than this size will be much more challenging because of the size of the tanks, application and flow rates required, resources required, and the logistics involved with the firefighting efforts. Unobstructed full surface fires can occur in fixed roof tanks without internal roofs when the weak seam at the roof-shell joint separates from an explosion or other over-pressure event, leaving an exposed full liquid surface in the tank. External floating roof tanks can have unobstructed full surface fires when heavy loads (e.g., rains) exceed the weight capacity of the roof, causing it to sink below the surface of the product. This may also occur if the roof drains have been left closed during periods of heavy rains.

■ Obstructed Full Surface Fires

Full surface fires with a fully or partially sunken roof can occur where tanks have fixed roofs, internally floating roofs, or external floating roofs. These fires are challenging because access to the



Images courtesy of Craig H. Shelley

▲ **Fire detection system in rim seal area. Interruption in electrical current by fire will activate foam system.**

▶ **Foam injection system for storage tank fire protection. This system must be started manually. Is your department familiar with the operation of this equipment? Especially at 2 a.m. when there may not be a facility operator on duty?**

burning surface is blocked by the roof or floating roof (pan). An increase in vapor pressure between the liquid and the roof can cause the pan to tilt, partially exposing product above the pan. Pontoon failure may also cause a pan to sink. Heavy rains may also tilt or sink a pan.

Fire Protection Systems

Fixed and semi-fixed fire protection systems are used in industry to protect various equipment and processes. They are used in many cases to protect petroleum storage tank facilities. In differentiating between a fixed and semi-fixed fire protection system we find that a fixed fire protection system has all of the components to produce water or foam discharges without the aid of a fire vehicle. Water and foam based systems may be activated manually or activated by the use of devices such as smoke, heat, or flame detectors. A semi-fixed system is required to be supported by a fire vehicle.

The following are some of the systems that may be found at petroleum storage tank facilities:

■ Rim Seal Protection

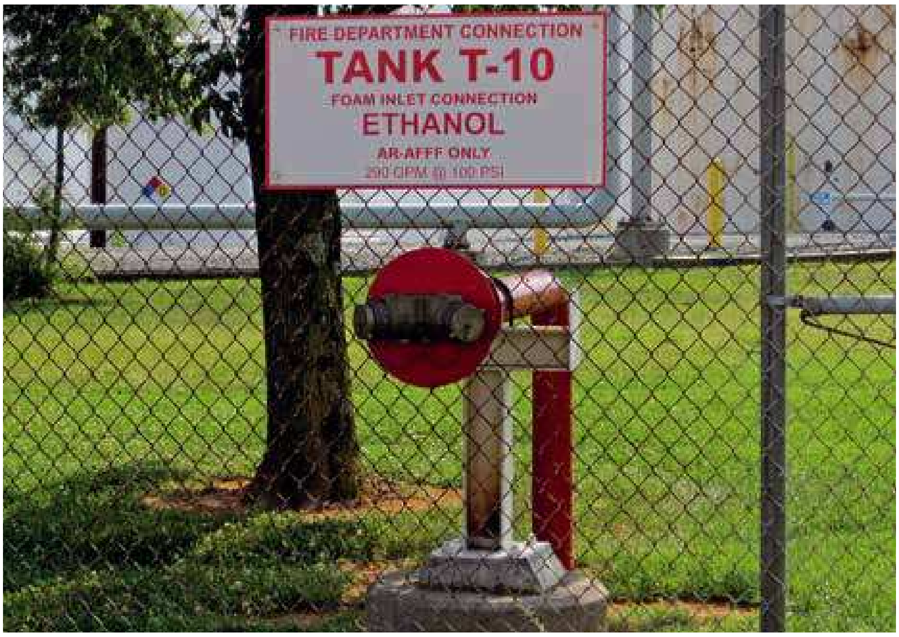
This is the most common type of system found on atmospheric storage tanks. They are installed on either an open top or covered floating roof tank. The rim seal will have a 30 cm (12 inch) to 61 cm (24 inch) foam dam designed to hold the foam in the rim seal area so that it can flow and extinguish fire along the seal. These systems can either be fixed or semi-fixed. Mostly, these systems will be manually activated. The manual procedures could include starting the fire and foam pumps as well as opening and/or closing valves. A semi-fixed system will require a fire vehicle to connect to a lateral terminal connection and supply the foam chambers with foam solution at a specific pressure. These pressures should be identified during pre- incident planning and signs posted at the manifolds indicating these pressures.

Foam chambers are typically installed for rim seal protection, but in some instances they may be installed for extinguishment of full surface fires in both floating roof and covered storage tanks. Once again, pre-incident planning will be crucial to allow the fire service to know how much foam solution should be flowed and at what pressures.

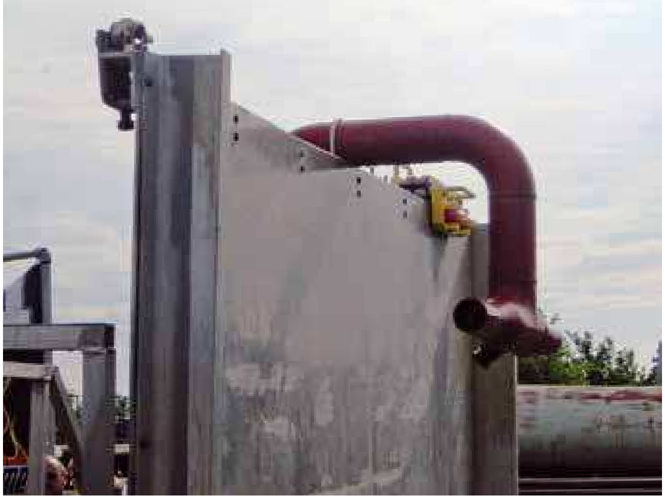
■ Subsurface Injection

Subsurface injection may be found on some covered roof storage tanks. When a floating roof is present, this system is not practical and cannot be used. The floating roof will keep the foam from reaching the surface of the fuel. These systems can either be fixed or semi-fixed. Aqueous film forming foams have low fuel tolerance and will not effectively rise to the surface. Subsurface injection also can not be used with polar solvent products. Once again, during pre-incident planning consult the plant operators to ensure that your personnel know how these systems operate and ensure that foam supplies,

▼ **Fire department connection for storage tank fire protection system. Note the pressures and flows for fire department operators.**



◀ Cooling rings on storage tank.



▲ Point and Shoot system. Note the two lateral and one downward discharge ports.

Images courtesy of Craig H. Shelley

both fire service and plant, are compatible with the fuel in the tanks. The foam solution must be injected above the water level in the tank. Foam injected below this level will dissolve into the water and not rise to the surface.

■ Cooling Systems

Another system that may be used is a cooling system. Cooling rings on the exterior of the tank are placed so that they discharge water onto the tank's exterior, protecting it from radiant heat from fire in close proximity. In many instances, these systems will have to be manually activated.

New Technologies

Looking back at storage tank fire protection we see that while fixed and semi-fixed systems have basically remained unchanged for 60 years but the size of the tanks has grown larger. In recent years, new technologies have been developed to make fixed and semi-fixed systems more efficient. As tank diameters increase, the degree of difficulty for extinguishment also increases. As with the rest of the fire service, new technologies help improve efficiencies and performance. Some of the new technologies for storage tank fire protection are:

■ Dual Agent Chambers

Traditional foam chambers would aerate the foam and distribute it evenly on rim seal or full surface fires. A dual agent chamber is a two-phase application through the same chamber. The first phase cascades a rich blanket of foam to extinguish and seal the surface of the contained product, while the second phase injects Purple K dry chemical to evacuate the internal vapor space of any lingering flammable vapors, rendering the space inert. These systems would be used on covered tanks.

■ Point and Shoot System

The Point and Shoot system provides a more aggressive and more efficient foam application as compared to traditional foam chambers. In actual tests, the Point and Shoot system provides 73 meters (240 feet) of coverage from one wand, a 200% increase in performance over a foam chamber. The foam wand will distribute foam from three orifices, two lateral and one discharging down the wall of the tank immediately below the wand. An optional feature is the addition of a separate riser to allow a specialized monitor to be quickly deployed and mounted to the tanks rim for additional extinguishment and/or vapor suppression.

■ Hollow Point

The Hollow Point system was developed to overcome issues faced by foam chambers when they are installed on a fixed or cone roof tank for the purpose of full surface protection. When foam chambers are installed, they rely on gravitational forces and the static head pressure of the foam to provide the propulsion for the foam to cover the surface area of the product. The Hollow Point system projects the foam toward the center of the tank as well as to the left and right along the tank wall.

■ Ambush

The Ambush system is designed for use on large diameter jumbo storage tanks. Type II "Over the top" applications on these tanks require huge amounts of resources and firefighting equipment. In some locations, 122 meter (400+ feet) diameter tanks are present. The Ambush is designed to provide enhanced fixed system response for external floating roof storage tanks. The system reduces foam fallout from the stream to provide more efficient foam/water application densities. It addresses four distinct areas of the tank simultaneously; the area to the left of the wand, the area to the right of the wand, the center of the tank, and the area directly below the wand. Multiple units may be required for complete coverage depending on the tank diameter.

Additional information on these new technologies can be obtained direct from the manufacturer of this equipment. An internet search will assist with locating the manufacturer.

This article and our previous one have discussed the types of atmospheric petroleum storage tanks, the types of fires, and fire protection systems. Our next installment will discuss the strategy and tactics involved with fighting atmospheric petroleum storage tanks as well as pre-incident planning techniques.

For more information, go to www.worldsafeinternational.com

References

1. Shelley, C. H., Cole, A. R. & Markley, T. E. Industrial Firefighting for Municipal Firefighters. Tulsa, OK: PennWell, 2007.

50 years of Reliable Protection

NEWAGE®
FIRE FIGHTING CO. LTD.

Protection With Reliability and Trust

Fight fire with complete range of
NewAge - make products.

intersec

Dubai (UAE)
17 - 19 January, 2016
Stand No. Hall 2, E-12

UL FM APPROVED GL CE

Address: "NKB House", P.O. Box No. 14, Mehta Market, Surendranagar - 363001, Gujarat, India
Phone No. : +91 2752 288 000, +91 99250 63730 I Fax : +91 11 6617 3355
Email : nffcl@newage-india.in I Website : www.newage-india.in

PAB Akrapović

When conditions are at their worst,
we are at our best.

THINKING
AHEAD

firefighting series

PAB FIRE HT 04
COMPOSITE or THERMOPLASTIC
EN 443:2008, EN 14458, MED Approved

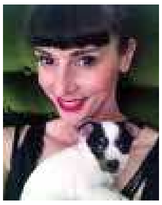
Designed to protect the head under the most extreme conditions. Optimal relationship between protection and comfort with a broad spectrum of optional upgrades. Structural firefighting has never been safer. Available worldwide!

PAB Akrapović | Most 26, HR-52420 Buzet, Croatia | info@pab.hr | www.pab.hr

SINCE **1953**

Helping Hands, Hurting Hooves: Large Animal Rescue

Large animal rescue occurs during the response phase to a natural or anthropogenic disaster, emergency or accident where specialised training and equipment are required to rescue an animal such as a horse, donkey, cow, other livestock, or ungulate wildlife. Successful and safe rescue requires emergency service personnel with specialist training, access to equipment and engineering resources, local knowledge, an understanding of the social psychology of animal owners. It also requires the co-ordinated efforts of emergency services providers with experts such as veterinarians.



Dr Kirrilly Thompson

MaryAnne Leighton

Professor Chris Riley

Dr Kirrilly Thompson is a Senior Research Fellow at the Appleton Institute, the Adelaide campus of Central Queensland University. She is a trained anthropologist with research interests in human-animal relations and the cultural dimensions of risk.

MaryAnne Leighton is the Large Animal Rescue educator with Queensland Horse Council Inc. and author of Equine Emergency Rescue- a guide to Large Animal Rescue. MaryAnne has 20 years experience with horses and managing horse studs. For information on Large Animal Rescue in Australia see www.equineER.com

Professor Chris Riley is Professor of Equine Clinical Studies and Head of the Equine Group at Massey University, NZ. He has trained and taught veterinary students, veterinarians, and animal health workers in Australia, Canada, Haiti, New Zealand, Peru, Thailand and the United States. He has parallel research interests in animal and human welfare, their interdependence, and how veterinarian may use their skills and experience to benefit both.

With advances in veterinary medicine, many injured large animals that previously would have died now have a viable chance of survival (Bedenice 2007). However, responders must work within a defined system of incident management and triage, and do so before the situation is irrecoverable. LAR training programs and rescue teams have been developed and refined internationally. More formal organisations include the British Animal Rescue and Trauma Care Association (BARTA). Since 2008, 90 per cent of UK fire and rescue services have established a formal LAR capability and are trained to a national standard (Green 2014). Their work is informed by well-respected manuals on the topic (Leighton & Staples 2010, Gimenez, Gimenez & Stafford 2007). However, there has been little explicit consideration of the ways in which human and animal safety are mutually incorporated and the challenges posed by the human-animal bond.

Three Australian case studies have been selected for discussion largely due to the availability of first hand, well-documented case material and permissions. The choice to include examples of 'successful' and 'unsuccessful' rescues is intentional.

Case study 1: Mud rescue

A 20-year-old horse was found stuck in mud in a dam. Its owner estimated the horse had been trapped there for around 12 hours. She called a veterinarian, fire and emergency responders.

▼ Mud rescues are some of the most difficult and dangerous.

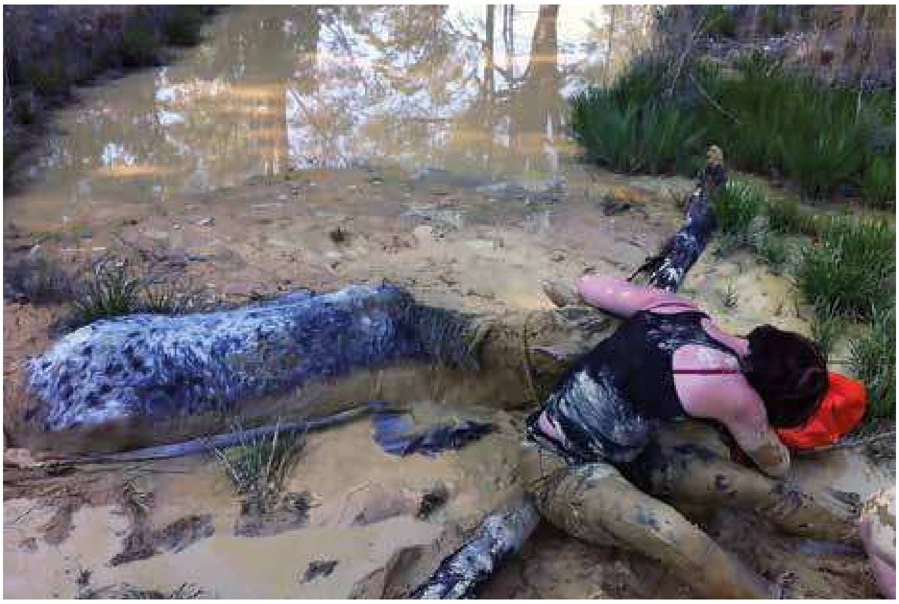


Image courtesy of Kirrilly Thompson

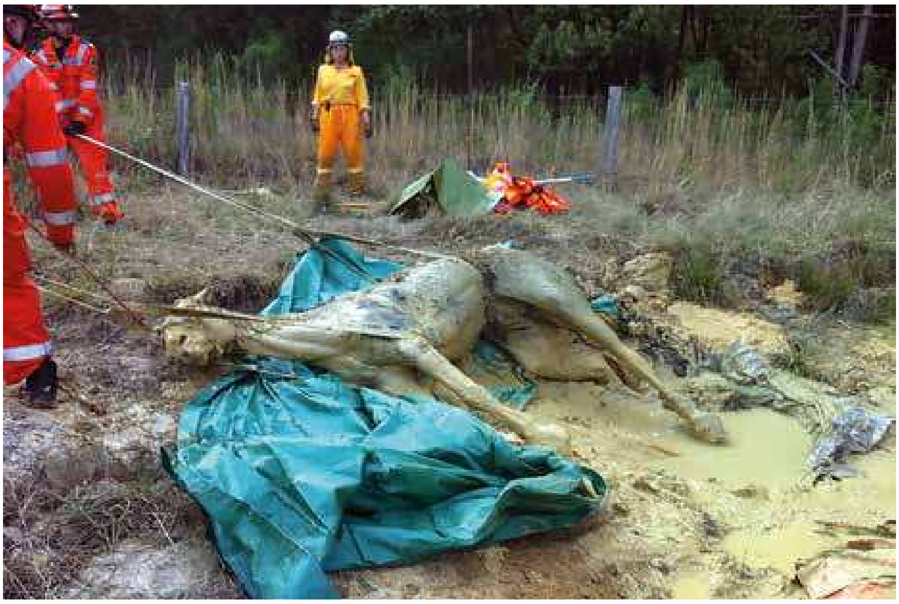


Image courtesy of Kirilly Thompson

◀ **Front strops should be at 90-degrees to the animal's body to avoid eye trauma.**

The Incident Controller (IC) had attended a 'train the trainers' weekend where he had learnt basic LAR techniques but not skills specific and critical to successful mud rescues. Normally this would entail the use of water injection around the animal's limbs to release the suction of the mud before attempting to extricate the animal (Gimenez, Gimenez & Stafford 2007). The IC's conversations with the veterinarian were secreted from the owner. He did not communicate with the owner or her companion, despite them wanting to offer basic suggestions to improve the horse's comfort, for example tightening the halter to avoid facial or ocular abrasion.

The responders had trouble getting strops around the horse, so (against LAR training advice) one volunteer lay on the horse's back to do it manually. Once the strops were in place, it took 40 minutes from the time they began pulling to the time the animal was extricated from the mud because they had not released the suction around the limbs. During that time, rescuers maintained the tension on the strops. The rescue team pulled on the trapped horse at an angle instead of in a straight line, dragging the strop across the horse's face.

Once the horse was extricated, it was dragged up a bank and left prone, about two metres from a barbed wire fence. As the horse instinctively struggled to stand, it slid closer and closer to the barbed wire. It was too exhausted to prevent its head from smashing back down on the ground after each attempt to rise. The horse's eye was swollen from trauma associated with the repeated and failed attempts to rise, and the cornea on downside eye was severely lacerated because a buckle on the halter kept sliding across it during the rescue.

The entire rescue took six hours. It is estimated that with using a Nikopoulos needle and water to release the suction of the mud, it could have taken 30 minutes. The horse had huge sores on its torso from the straps. Because it was resting on one side for so long, it developed pressure sores over the underside of its body and a severely swollen eye. The horse was too exhausted to eat or drink. The dark brown colour of its urine was consistent with dehydration combined with rhabdomyolysis (rapid muscle fibre destruction). The horse never rose and, following consultation with a veterinarian, was humanely euthanised the following day.

Case study 2: Flood rescue

During flood preparations, a Royal Society for the Prevention of Cruelty to Animals (RSPCA) inspector was notified of horses stranded on a river island. The water was too high and fast to safely or successfully walk the horses to safety. After consultation between the inspector, responders, and local equine veterinarians, it was decided to return the following day and remove them from the island by boat. As flood rescue requires the horses to be prone and sedated for evacuation by boat, this became a highly organised joint rescue involving four RSPCA inspectors, four responder volunteers, and two veterinarians, all of whom were trained in LAR. Equally importantly some had swift water training.

The following day, the IC identified the hazards posed by the rapidly rising water and assessed the risks to the rescue team. He concluded that the rescue plan was viable, and selected procedures that would avoid injuring horses or rescuers. He chose a flat-bottomed bow-loading flood boat, the front of which folded down to form a flat surface for loading a laterally recumbent (sedated or anaesthetised) horse strapped to a rescue glide (an equine version of a backboard for humans).

The IC divided the rescue team into two groups. Two RSPCA inspectors were with the land-based team who remained on shore to help unload the horses and monitor their recovery from sedation. The island rescue team launched the boat and headed downstream. The IC radioed a television helicopter that was filming the flood and asked them to fly over the densely vegetated island to locate the horses. The pilot hovered over the safest point for the boat to land and pointed the helicopter's nose toward the horses so rescuers wouldn't waste time searching.

The rescue boat operator navigated the boat through uprooted trees and other debris in the flooded river that, in the intervening 24 hours, had risen a further 1.5 metres. Once safely on the island, the remainder of the team stayed with the boat while a responder and two inspectors approached the horses.

Despite being unhandled for many years, and fearful of the floodwaters and the helicopter, the horses were coaxed into being haltered and led to the handling point near the boat. The veterinarian sedated the first horse, and the crew quickly put rescue straps around its torso and dragged it onto a rescue glide. One responder acted as the 'veterinarian assistant' responsible for making sure the veterinarian was never in harm's way (especially while she was distracted when administering drugs and disposing of used sharps into a suitable container).

Both veterinarians accompanied the horse on the boat for the ten-minute journey to the boat ramp on the opposite bank, with supplementary sedation at the ready to ensure the safety of all on board. Once on dry land the rescue glide made it easier to transfer the horse to a low-loader

▶ Sedated horse strapped to a glide for safe transport on a rescue boat.

Image courtesy of Kirrilly Thompson

trailer. It was driven a couple of hundred metres to a holding yard (safe zone) where one veterinarian stayed with it until it recovered. By this time the second rescue glide was on the rescue boat and the team was on its way back to the island to repeat the process for the second horse with a second veterinarian.

This was the first rescue of this kind that had been conducted by any of the three agencies. Its success was attributed to all persons involved being a LAR instructor or having undertaken at least the two-day LAR training course. The rescued horses were physically unscathed and later adopted.

Case study 3: Gully rescue

A 32-year-old mare, with arthritis and Cushings disease, had fallen into a gully. It was at the bottom of a steep, deep, narrow gully. Its hooves were higher than its body and its head was positioned lower than the body and legs. It was unable to stand even with assistance. The Rural Fire Brigade was undertaking LAR training at the time of the call and decided to combine training with the rescue.

As typically encountered with entrapped horses, the mare had periods of calm followed by periods of frantic thrashing as it tried to get up, repeatedly smashing its head on the ground with each attempt. Upon the brigade's arrival, the horse owner's husband was in the 'hot zone' (the zone of greatest risk to rescuers), trying to calm the mare.

Because it was a Sunday, it took almost an hour to locate a veterinarian who was able to attend, and another 30 minutes before she arrived. That gave the brigade crew and their training instructor time to assess the risks, plan and make contingency plans, unpack equipment and establish hot, warm and cool zones in accordance with incident response protocols (Leighton & Staples 2010) and an equipment dump.

Because the mare had been down for six hours by the time the veterinarian arrived, she decided to fully anaesthetise, rather than just sedate the animal. The mare was lying on a tree root that extended the length of her body preventing the use of the strop guide. The lifting strops were 'flossed' (sliding backwards and forwards) under the mare's shoulder to the girth, and under the rump to its flank. The First Officer assisted the veterinarian to place a padded hood over the mare's head and halter to protect it from further injury. Four members of the crew attached the sling strops to the crane. Two rescuers stood clear while two others supported the head during the lift.

Once extricated, the mare was rolled into a comfortable and safe position for recovery from anaesthesia. In spite of its age and the length of time it was trapped, the mare recovered fully. The brigade is now the lead agency for LAR in their region of the state. In the 18 months since this rescue, the number of rescues has risen from an average of one horse or cow rescue per year to nearly 20 large animal rescues (greater than one per month).

Discussion

The difficulties described in the case studies demonstrate the need for a collaborative, multidisciplinary paradigm for animal rescue. LAR requires the same organisational principles and teamwork as for a road crash rescue or house fire. While the importance of specialist LAR training for first responders seems obvious (Smith, Thompson & Taylor 2015), the case studies illustrate the significance of all stakeholders being proficient in:

- the principles and protocols of LAR
- multidisciplinary teamwork and communication
- the unique role and responsibilities as a responder/ veterinarian/ owner/ inspector etc (see also Farm Animal Welfare Committee, 2012).

While introductory training is useful it is not a replacement for comprehensive training involving responders and veterinarians, and constant revision and practise. Overseas, minimum training standards and effective interagency collaborations have resulted from the creation of a national body. This provides capacity and knowledge that could be adapted to an Australian emergency services context for wide benefit. Beneficiaries of BARTA, for example, have included 'sporting equine event managers, military mounted regiments, welfare organisations, livestock and equine owners, hauliers, veterinary hospitals and NGOs' (Green 2014: 13).

Training may also have secondary benefits in providing the impetus for stakeholders to engage in related practices and behaviours beyond the actual rescue event. For example, owners should appreciate the benefits of ensuring their domestic large animals can be easily caught, haltered, handled and transported by strangers. They might be more capable of conducting informal risk assessments of their animal's surroundings based on their specific knowledge of the local environment. By reducing the exposure of their horses to risks such as dams, they can reduce the incidence of rescues. Veterinarians might be motivated to improve their knowledge of emergency medicine of stressed animals under challenging working environments. Indeed, the inception of BARTA has seen 'the primary role of the veterinarian shifting from performing post incident care, to providing essential safety measures for responders in order to carry

Image courtesy of Kirrilly Thompson

A spreader bar prevents animals becoming unbalanced during vertical crane lifts.

out rescues' (Green 2014: 13). Small animal veterinarians might become more acutely aware that they could be called on to assist in LAR, even in urban environments, as can be the case with livestock transport accidents (Miranda-de la Lama et al. 2011) and animal-vehicle accidents (Rowden et al. 2008). First responders could appreciate the benefits of understanding and gaining skills to manage the manifestation and impact of close human-animal bonds on the behaviour of animal owners, the public, and the media. This knowledge could improve interdisciplinary communication while participating in or leading a rescue, and therefore improve the prospect of a successful outcome following a rescue.

The case studies reported are pertinent reminders that:

- while large animals present challenges to rescue due to their size and weight, planning and co-ordination can be of more use than brute force and urgency
- while responders may be in leadership positions during rescues, the rescue can be effected by their communication style and approach with owners and veterinarians
- while owners can be a hindrance, their expert knowledge can contribute to safe and successful rescue, and the location of suitable safe zones
- while the media can intrude on rescue situations, their presence can be used to the advantage of the rescue.

These generalisations from the case studies are entirely reasonable. However, without standardised incident reporting of animal rescues, there is no evidence base to determine best practice or evaluate the effect of interventions such as training (Howlett & Turnbull 2009) and advancement in technological aids such as glides and slings (Fürst et al. 2008, Gimenez, Gimenez & May 2004). Neither are statistics on death or injury to humans and animals during or post LAR required to be systematically collected. Both seem warranted.

Sadly, case study one provokes a clarification of the definition of 'successful rescue'. The gelding was successfully rescued but the inefficient process led to animal euthanasia, risk exposure to the rescue team, and loss to the owner. Even if a horse seems to survive a rescue with no obvious external problems, a veterinarian should monitor the horse post-rescue as collapse or death can occur some days later (Riley 2012). With this in mind, metrics of animal rescues should distinguish between survival of the animal (or human) at the time of extrication from danger as well as recovery from the event. This necessarily provokes an important ethical debate: when to rescue and when to euthanase in situ and recover the carcass for appropriate disposal.

Finally, post-traumatic stress disorder is a common after effect of emergencies, disasters and rescues (Neria, Nandi & Galea 2008). Responders, experienced in human rescues, can be shocked at how they are affected by animal rescues, especially when they go wrong (personal communication: Anthony Hatch). Similarly, veterinarians can encounter human injuries and fatalities at LAR scenes, and high stress levels are often experienced in emergency or disaster situations (Taylor et al. 2008). This risk should be flagged in training sessions, all rescuers should engage in post rescue debriefing, and affected responders should be encouraged to seek counselling.

For more information, email kirrilly.thompson@cqu.edu.au

References

Bedenice D 2007, *Evidence-based medicine in equine critical care. Veterinary Clinics of North America: Equine Practice, 23, 293-316.*

Farm Animal Welfare Committee 2012, *Opinion on Contingency Planning for Farm Animal Welfare in Disasters and Emergencies. London, UK: Department for Environment, Food and Rural Affairs.*

F rst AE, Keller R, Kummer M, Manera C, von Salis B, Auer J. & Bettschart-Wolfensberger R 2008, *Evaluation of a new full-body animal rescue and transportation sling in horses: 181 horses (1998–2006). Journal of Veterinary Emergency and Critical Care, 18, pp. 619-625.*

Gimenez R, Gimenez T & May KA 2007, *Technical Large Animal Emergency Rescue, Iowa, United States, Iowa State University Press.*

Gimenez RM, Gimenez T & Stafford K 2004, *Implementation of the Equine Rescue Glide. Journal of Veterinary Emergency and Critical Care, 14, pp. S1-S17.*

Green J 2014, *What have we learned about animal rescue in the last decade? Fire Times. United Kingdom: modern media publications.*

Howlett M & Turnbull C 2009, *Large animal emergency rescue training, Australia, Agrifoods Skills Australia International Specialised Skills Institute.*

Leighton M & Staples M 2010, *Equine Emergency Rescue: a guide to Large Animal Rescue, Oxenford, Qld, Velvet Visions Press.*

Miranda-de la Lama GC, Sepulveda WS, Villarroel M & María GA 2011, *Livestock Vehicle Accidents in Spain: Causes, Consequences, and Effects on Animal Welfare. Journal of Applied Animal Welfare Science, 14, pp. 109-123.*

Neria Y, Nandi A & Galea S 2008, *Post-traumatic stress disorder following disasters: a systematic review. Psychological medicine, 38, pp. 467-480.*

Riley C 2012, *Emergency management of horses and food animals involved in disasters. Proc AVA NT Conference- Disaster Medicine and Management. Darwin, Australia.*

Rowden P, Steinhardt D & Sheehan M 2008, *Road crashes involving animals in Australia. Accident Analysis & Prevention, 40, pp. 1865-1871.*

Smith B, Thompson K & Taylor M 2015, *What's the big deal? Responder experiences of large animal rescue in australia. PLoS Curr, 7(January 22). doi: 10.1371/currents.dis.71d34082943fa239dbfbf9597232c8a5*

Taylor MR, *Agho KE, Stevens GJ & Raphael B 2008, Factors influencing psychological distress during a disease epidemic: data from Australia's first outbreak of equine influenza. BMC public health, 8, p. 347.*

Help us find Ashley a home

The Emergency Services Foundation is proud to announce the release of its **first edition, collectable bear called Ashley**. A tribute to Victoria's firefighters and emergency service workers.

Proceeds from the sale of Ashley will help fund the ESF's activities:

- Scholarships
- Annual Conference
- Learning and networking opportunities
- Welfare support, front-line personnel

Which benefit all volunteer and member agency staff across the emergency management sector.

Ashley stands at an overall height of 45cm and is dressed in the Lancer-style uniform with double-breasted tunic, trousers and replica brass helmet. The belt is equipped with precise replicas of the fireman's axe and turn-key of the period. The tunic has one red collar and the other yellow recognising both the MFB & CFA at that time. The number "83" is embroidered on the tunic in memory of the Ash Wednesday Bushfires.

Every bear has been manufactured to very exacting detail, is fitted with a numbered certificate of authenticity and supplied in a presentation box that highlights the history of firefighting in Victoria.

Limited to just 4,000 units, this fire-fighting bear will be keenly sought by collectors from around the world!

Cost of each limited edition bear is $100 + $9 postage & handling per unit.

To order Ashley
Visit www.esf.com.au/bear
Email bears@esf.com.au

The ESF helps those who help the Community.

EMERGENCY SERVICES FOUNDATION EMV DELWP CFA MFB SES VICTORIA POLICE

THE FIRST AND STILL THE BEST

In 1987, Tempest became the first positive pressure ventilation fan used in firefighting. Today, we're proud to say we're still the most used and most trusted.

Tempest Technology Corp.
www.tempest.us.com

SEE THE CLARITY.

X FACTOR

THERMAL IMAGERS

UPGRADE
Upgrade your
Bullard TI at an
affordable price

TRADE-IN
Get credit for
trading in Bullard
and other TIs

5-YEAR WARRANTY
5-year full
TI warranty

Bullard®

Learn more at
www.bullard.com/xfactor

A Fire Service Tradition

A fire helmet to a firefighter represents the tradition and spirit of the fire service. The helmet is a personal piece of equipment that tells a story about the firefighter who wears it. For centuries, firefighters have relied on their helmets to protect them through the toughest fire environments. Manufacturers of fire helmets have used advanced engineering techniques and innovative designs to improve the fire helmet to better protect firefighters from harm. Let's take a look at the evolution of the fire helmet.

Vincent Lee

Vincent Lee is the Head Sales Manager of Bullard Asia Pacific who leads the Industrial Safety and Health Division and Emergency Responder Division.

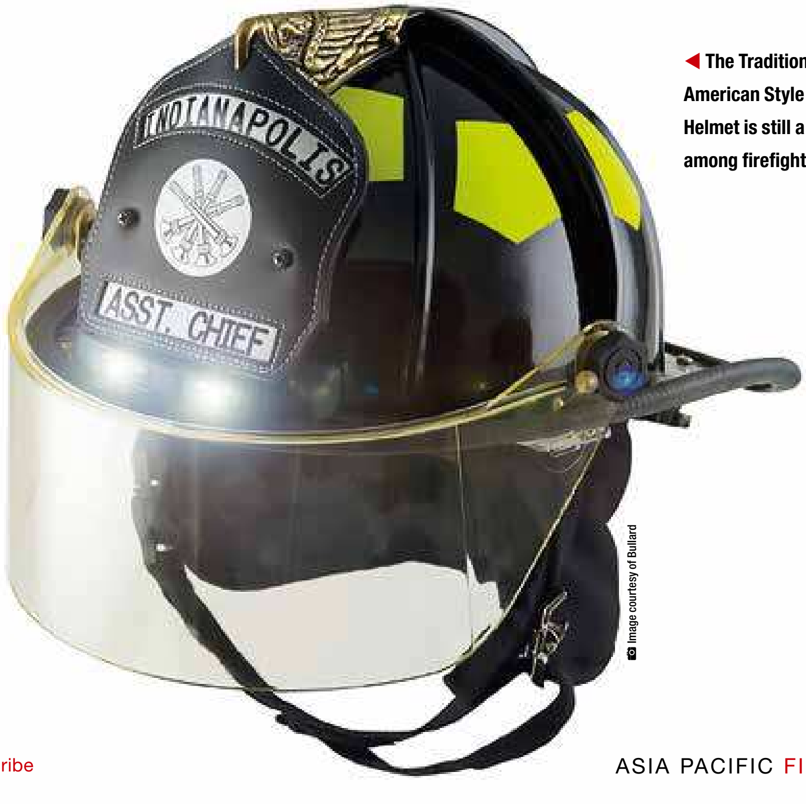
The Fire Helmet…Then and Now

In 1740, Jacobus Turk, a firefighter from New York City, invented the first leather fire cap to protect his firefighters from the intense heat from structural fires. His helmet was rounded with a narrow brim and although it was an innovative design it didn't offer much protection from high heat or impact. In 1836, Henry T. Gratacap, a volunteer New York City firefighter, designed a more modern eight comb fire helmet. Most of today's fire helmets are designed in this form with eight triangular sections coming from the brim and joining at an apex above the firefighters head.

At the turn of the century, aluminum fire helmets were introduced to the fire service. These helmets were designed to look just like the traditional leather helmets but were much less expensive to produce. Firefighters quickly realized that the aluminum helmets were not ideal for firefighting environments since aluminum not only conducts heat but also electricity. Manufacturers quickly abandoned the aluminum helmets and moved back to the leather style model.

Engineering technology advanced and by the late 1940s manufacturers were designing fire helmets using fiberglass materials. In 1979, the National Fire Protection Association (NFPA) developed standards for structural firefighter helmets. The standard required that fire helmets be tested for resistance to electrical current, penetration, impact and heat and flame resistance. With this new standard, manufacturers began exploring the use of more modern materials, such as fiberglass and thermoplastic.

These materials, unlike the aluminum, were durable and heat resistant and provided a high level of protection for



◀ The Traditional American Style Fire Helmet is still a favorite among firefighters.

© Image courtesy of Bullard

▲ **The Jet-Style Fire Helmet is becoming more popular among firefighters on a worldwide stage.**

firefighters. In 1983, the NFPA approved the first thermoplastic fire helmet for the fire service. Thermoplastic and fiberglass are two of the most popular materials, in addition to leather, used in fire helmets today. The leather helmet, also known as the "leatherhead," is made mostly of all leather materials. This is the true traditional helmet that firefighters first embraced hundreds of years ago. Leather helmets are resistant to heat and provide firefighters with the look, feel and smell many prefer; however, leather is expensive, heavy and often requires longer lead times to produce because the helmets are all hand-sewn. Let's look at the benefits and shortcomings of thermoplastic and fiberglass materials.

Thermoplastic and Fiberglass Materials

High performance thermoplastics offer superior impact protection, durability and heat resistance when used in fire helmets. Thermoplastic becomes softer and more malleable as it gets warmer and harder and more brittle at lower temperatures. These unique properties are helpful in a high-heat environment such as a fire. Today's high-heat thermoplastics are designed to withstand short-term, repeated exposure to temperatures of 260° C (500° F). Enduring temperatures at 260°C or higher may result in the thermoplastic material bubbling or blistering. When exposed to high heat for a prolonged period of time, plastic begins to absorb moisture. The plastic gets softer and will withstand impact; however, when the helmet cools off a bubbling or blistering can be seen. If this occurs in a fire helmet it is an indication that the helmet has seen too much heat and must be replaced. Although the helmet has blistered, thermoplastics are designed to continue to provide high impact protection after the surface has cooled.

When firefighters think of a traditional fire helmet, they most often think of leather or a composite (fiberglass) helmet. We've already addressed the concerns with leather being expensive and heavy and requiring longer lead times. The fiberglass helmets provide good protective properties; however, it's important to understand how fiberglass performs in firefighting situations. Fiberglass is actually composed of two materials: a thermoset resin (essentially a glue) and glass fibers which can vary in length. Thermoset resins are a family of plastics that do not melt at high temperatures and are created by mixing two base materials. One of the ingredients is a catalyst that, when combined with the other agents during molding, will solidify, locking itself and the glass fibers into a rigid state. The strength of a thermoset composite material comes primarily from the fibers of glass or other materials that are bonded together by the resin. The real strength of the helmet comes from the resin.

The resin and the fibers in a fiberglass helmet are formulated to make a product that has a good balance between strength and weight. Fiberglass offers great resilience when exposed to chemical agents; however, the resin of a composite helmet will degrade with repeated exposure to extreme temperatures. Each exposure to high heat weakens the molecular structure of the resin. Lower temperatures will also degrade the resin but over a much longer period of time. Ultraviolet (UV) exposure from sunlight has a similar effect on these resins.

Fire Helmet Models

There are a variety of fire helmet models on the market today, but three specific designs are the most popular among firefighters: the traditional American helmet; the streamlined contemporary helmet; and the jet-style helmet.

The traditional helmet, which was first embraced hundreds of years ago, is designed with ribs protruding from the dome, created by the joining of eight triangular sections, with a long brim in the back of the helmet to allow water to drip off and often adorned with a customized shield in the front to identify the firefighter. The contemporary helmet is often a lower profile and lighter weight design than the traditional, offering more streamlined and simple lines. This style helmet allows for the face, eyes and neck to be protected with visors, eye shields, and neck protectors. The jet-style helmet is becoming more popular on an international stage. This style looks more like a motorcycle helmet, wraps around the head with no extended brim and allows for greater integration of eye protection, communication devices, and breathing apparatus. This helmet provides greater comfort and many customization options for firefighters.

Conclusion

Whether the fire helmet is thermoplastic, fiberglass, or leather, styled to be traditional, contemporary, or jet-style, it has served as the firefighters' first line of defense for more than 300 years when facing the hazards of the job. When the call comes in, the fire helmet is the first piece of equipment a firefighter grabs. It's personal. It's tradition.

For more information, go to www.bullard.com

TEXAS A&M ENGINEERING
TEEX
EXTENSION SERVICE

The International
Fire & Emergency Training Leader

TEEX trains emergency response personnel from more than 45 countries each year!

Choose from over 130 courses including:

- Firefighting
- Emergency Medical Services
- Fire Investigator
- Fire Officer / Instructor
- Hazardous Materials Response
- Rescue / Urban Search & Rescue
- Industrial Emergency Response
- Marine / Oil Spill Response
- LNG Emergency Response
- NIMS / ICS
- Annual Spanish School
- Latin American Emergency Response
- Leadership

Each course can be tailored to meet your exact needs in a variety of areas

Schedule your classes and
Experience the HEAT!

C13.6627.02

1-866-878-8900 www.teex.org/fire

SAPHIRE COMPLETE TRAINING CONCEPTS

FLASHOVER UNIT – NOZZLE UNIT – EMISSION CONTROL – WOOD-FIRED TRAININGOBJECTS – GAS-FIRED TRAININGOBJECTS

CLEAN EMISSION

Flashover- & Nozzle-unit at ROYAL NETHERLANDS NAVY training school.

Highrise training unit at Gooi & Vechtstreek Safety region's fire training ground.

Basic fire fighting training unit stationed at Metropolitan Fire department Istanbul-Turkey.

CREATORS OF TRAINING HARDWARE

SAPHIRE is building up a global reputation as a valued developer and manufacturer of standard and XpertBuild training modules. One of SAPHIRE's unique characteristics is that it offers services to a range of industries including the world of fire-fighting, renewable energy industry and the offshore- and maritime industry. Visit our website to view our range of products and services.

BRIELLE - THE NETHERLANDS
WWW.SAPHIRE-CTC.COM

STANDARDS

AS/NZS 4067:2012, EN443:2008, NFPA 1971:2013, NFPA 1951:2013
CERTIFIED FOR STRUCTURAL FIREFIGHTING AND TECHNICAL RESCUE

SAFETY WITHOUT COMPROMISE WWW.PACIFICHELMETS.COM

PACIFIC
HELMETS

Pure Force Serving the Public Safety Needs of the Philippines

Nationwide emergency alert number and dispatch center raises safety and security response for the people of Philippines. It all started with a vision – to improve the daily lives of every Philippine citizen for a safer and more secure community.

Mike Creevey

Jomerito "Jojo" Soliman is the man with that vision. He is the founder of Pure Force and Rescue Corporation Philippines ("Pure Force"), which is a private initiative created to connect emergency response agencies across Philippines. Home to nearly 100 million people, Philippines lacks a centralised emergency response system, including a nationwide emergency telephone number, making the coordination between law enforcement, fire and emergency response agencies difficult.

For the vision to come true, Pure Force needed an incident management solution to quickly dispatch first responders, connect national agencies, and manage emergencies in real time across a country of 81 provinces, 144 cities and 1,490 municipalities.

Needing to modernise incident management system and services

For a long time, every Filipino has had to grapple with the frustration of dealing with a different emergency hotline in every city. Without one known, centralised emergency number to call, people don't always know how to react during a crisis. Sometimes, they end up rushing to a station for help themselves, rather than picking up a telephone to reach professional help through a land or mobile line.

Furthermore, without a modern centralised emergency system in the country, it has become increasingly challenging for prompt, coordinated response among the national agencies. The unduly delay in quality or timely response can result, ultimately, in the loss of properties and lives, which could have been salvaged and saved otherwise.

The consequences of an absent or antiquated nationwide emergency response services can be both dreadful and deadly for this Southeast Asian

▼ **Managing incident response through the centralised I/CAD emergency dispatch system.**

Image courtesy of Hexagon Safety & Infrastructure

Mike Creevey is Vice President of Sales for Hexagon Safety & Infrastructure.

Images courtesy of Hexagon Safety & Infrastructure

▲ **Using Intergraph Computer-Aided Dispatch (I/CAD) system in Pure Force's command centre.**

country prone and frequently plagued by natural disasters. Philippines, located at the heart of a large typhoon belt in the Pacific Ocean, has been struck by major storms, violent earthquakes and other natural disasters in the last century. The most notorious being the super Haiyan/Yolanda typhoon in 2013, leaving a massive trail of destruction with thousands dead, millions of homes damaged, infrastructure destroyed and an economy in tatters.

With this in mind, Soliman is determined to set up an emergency response system that is fully functioning; one that the police, fire and rescue, and ambulance services could rely on, and one that his countrymen could count on wherever help is needed. The goal is for a system that will be as similarly successful as the 911 and 999 emergency services in United States and in United Kingdom respectively. From roadside assistance to critical emergency situations like fire, crimes, or medical emergencies, Philippines citizens could then be assured to reach out and receive help anywhere, anytime regardless of the city where they are located.

▼ **Responding to search and rescue work with Pure Force's helicopter.**

Soliman's vision is "for each city to manage their dispatch for standard emergency calls. During disasters, national agencies can have a joint operation using the Pure Force application where they can assess and deploy relief efforts across the country."

Innovative use of Hexagon's dispatching and mobile technologies

Pure Force selected Hexagon Safety & Infrastructure (Hexagon) to implement its industry-leading Intergraph Computer-Aided Dispatch (I/CAD) system and Mobile Responder application to serve as the foundation for Pure Force's first responder operations in Philippines. The industry-leading incident management software features complete integrated capabilities for call-handling, dispatching, intelligent mapping, field communications, data reporting and analysis, and application integration.

With the implementation of I/CAD in 2015, Pure Force's command center boasts one common operating picture that facilitates the sharing of mission-critical information among the various agencies – police, fire and rescue, ambulance – in different local cities across the country. This incident management solution allows Pure Force to efficiently process calls, monitor events, dispatch services, coordinate with other agencies, gain insights into incidents, and access business intelligence data. This means that the law enforcement, emergency medical, and fire and disaster rescue services in Philippines can effectively minimise response times and respond quickly to save lives by tracking incidents and managing emergencies in real time.

Additionally, Pure Force is equipped with mobile dispatch capabilities, via Mobile Responder, on smart phones. Mobile Responder essentially extends I/CAD's incident management capabilities to first responders on the field. They can readily access critical applications, map-based display and real-time data whether they are in their vehicles, on motorcycles or on foot. Using wireless technology, field personnel can also create events, update status, take field calls, and send and receive messages. Therefore, the users are empowered with truer situational awareness that increases safety, performance and productivity.

In addition to supporting the needs of first responders, the Hexagon mobile technology also supports the needs of citizens through a Pure Force mobile application. Users can register their mobile number at www.pureforce505.com to activate the app. The installation of the free app requires users to provide their home address and location via GPS. The Pure Force mobile app is designed with a map-based display screen with distinct emergency-type buttons. Users can send messages to Pure Force through the Internet, text message or a call (02-86-505). In most critical emergency situations, all one has to do is tap the screen. The intelligent app will notify Pure Force about the emergency in real time whether someone is in need of medical care, or rescue from danger or fire. Perhaps most important of all, all citizens, including those without smart phones, can now call for help with one easy-to-dial, five-digit hotline number (86-505) where members of the public can get help once the system becomes operational in the city.

This means the citizens can now be easily connected to centralised emergency services with a single click or call regardless of the city they are located in. Rescue and relief efforts can then be quickly assessed and deployed with the nearest and most appropriate personnel or crew to the scene.

Altogether, Hexagon's I/CAD and Mobile Responder ensure that the right, reliable information is always on hand – at the desk and in the field – for the entire force at Pure Force to respond precisely. They benefit from one seamless interactive interface that can incorporate information from thousands of sensors and systems, and one single integrated technology that can manage multiple agencies across the country during crises.

Benefiting the agencies

Graphically powerful thin client terminals combined with centralised cloud computing resources are used in the I/CAD and mobile software implementations for Pure Force. In a nutshell, the configuration designed for Pure Force delivers superior security features, data integrity, remote accessibility, resource management and cost savings, with greater ease of scalability and upgrade in its information technology infrastructure.

It also promotes interoperability via rapid interfacing with other information systems to improve incident planning, response and resolution. In other words, it is now easier and faster to share information, connect data, and collaborate with other agencies so that more accurate situational awareness is created for optimised emergency response.

Most significantly, these have enabled Pure Force to have an exceptionally advanced "virtual" nationwide command centre with dynamic information, smarter workflows and location intelligence for its specialised search and rescue operation.

Moreover, the vital call information logged generates volumes of data that can be used by Pure Force and national agencies to extract compelling intelligence and deliver actionable information on crime activities, incidents trend, operational planning, resource allocation, organisational response, and more.

Notably, the Metro Manila Development Authority, and the Philippine National Police and Bureau of Fire Protection (in the national capital region) are some of the leading agencies which have implemented the solutions in partnership with Pure Force.

Benefiting the citizens

Pure Force is donating the mission-critical software to every city in Philippines to help overcome the challenges and expand its coverage nationwide. The software was rolled out first in Manila, the nation's capital, in November 2014, and 30 cities now have the solutions. They are: Aklan, Butuan, Cebu city, Cebu Bogo, Cebu Consolacion, Cebu Mandaue, Caloocan, Davao, Las Piñas, Makati, Malabon, Mandaluyong, Marikina, Muntinlupa, Navotas, Parañaque, Pasay, Pasig, Pateros, Quezon city, Rodriguez Rizal, San Mateo Rizal, San Jose del Monte, San Juan, Taguig, Valenzuela.

Soliman and Pure Force are relentlessly realising their vision to safeguard communities and citizens, and bring about a safer, stronger and more resilient Philippines.

For more information, go to www.hexagonsafetyinfrastructure.com

▼ Pure Force's fully equipped emergency response team.

Image courtesy of Hexagon Safety & Infrastructure

sicor-sureco.com

When comes the time for facing situations of extreme
danger, for protecting your companions and saving
the lives of others, the only thing that matters
is to do so without worrying about yourself.
Every day, all you have to do is make the right choice,
is choose the right partner to watch your back.

SICOR

With you, Protecting you.

Helmet EOM

EN 16471:2014
For wildland fire fighting
EN 16473:2014
For technical rescue
EN 12492:2012
For mountaineers

Helmet VFR EVO

EN 16471:2014
For wildland fire fighting
EN 16473:2014
For technical rescue
EN 443:2008
For fire fighting in buildings
and other structures

For 30 years Sicor has been developing, manufacturing, and supplying
the best helmets for the protection of many prestigious Fire Brigades in the world.

Strengthening Early Warning Systems for Disasters

It is clear that Southeast Asia is highly prone to natural disasters such as floods, droughts, cyclones, typhoons and tropical storms. The Great Indian Ocean Tsunami in 2004, Cyclone Nargis in 2008, Typhoon Ketsana in 2009 and the Thailand Floods in 2011 are examples of the catastrophic events that have affected the region in recent history. Each event caused extensive economic damage and took its toll on human lives.

Dr. Rishiraj Dutta

Dr. Rishiraj Dutta serves as Technical Specialist at the Department of Climate Change and Climate Risk Management at Asian Disaster Preparedness Center.

These incidents make it apparent that there is a need to alert people of the risks posed by natural disasters. However, this realization came too late when over 230,000 people lost their lives due to the 2004 tsunami.

This event highlighted the immediate need for early warning systems in the Southeast Asian region, promoted by the global outpouring of support. It also presented an opportunity to raise public awareness on the importance of building greater resilience towards natural disasters.

During the World Conference on Disaster Reduction in 2005, development leaders stressed the importance of developing early warning systems that are people-centered, which means that they deliver timely and understandable warnings to those at risk. This would reduce disaster risk and improve safety, and increase awareness in disaster-prone regions.

Today, many countries in Southeast Asia have established early warning systems for better preparedness complimenting one of the seven global targets as outlined in the Sendai Framework for Disaster Risk Reduction 2015–2030. The Sendai Framework acts as a guidance document for disaster risk reduction development initiatives over the next 15 years.

Identifying gaps in disaster communication

The primary objective of having an early warning system is to empower individuals and communities to respond timely to natural hazards by following the four components developed by the United

▼ **The team practices emergency response during a simulation and drill in Toungoo township in Myanmar.**

Image courtesy of Rishiraj Dutta

© Images courtesy of Rishiraj Dutta

▲ Community members evacuating due to a riverine flood in Toungoo township in Myanmar during ADPC's emergency simulation.

Nations Office for Disaster Risk Reduction. The components that are aimed at reducing the risks caused by disasters to life and property include the use of risk knowledge, monitoring and warning services, dissemination and communication, and response capability.

Although early warning systems are in place in the region, improving the effectiveness of a system does not in itself lead to reducing disaster risk. One needs to understand the functionalities of the system and ensure the system is regularly updated.

▼ A group of community first responders together with the trainers at ADPC's emergency simulation in Toungoo township in Myanmar.

By definition, an early warning system sends alert messages to the vulnerable populations during the event of an upcoming disaster. It is made up of a chain of communication channels that are comprised of sensors, detection systems, decision support tools and sub-system messaging tools. As high-tech as the system is, it is still at risk of errors if policy and practice do not support the technology.

While most countries in Southeast Asia have well-established early warning systems, identifying the existing gaps in warning dissemination and response can help address shortcomings, and aid countries and the international community in strengthening the systems.

Asian Disaster Preparedness Center (ADPC) has been helping governments and communities improve their capacity to effectively respond and adapt to the changing climate by strengthening early warning systems in Southeast Asia.

ADPC promotes partnerships and networking across communities, countries, institutions and sectors. This facilitates the exchange of experiences and practices in strengthening early warning systems by identifying and filling gaps in existing policies and institutional arrangements of National Disaster Management Organizations and other agencies. The learning exchange builds expertise among stakeholders for the effective application of warning information.

Over the years, ADPC has implemented various projects in the region with a focus on strengthening early warning systems. From this work, we've selected success stories from Myanmar and Cambodia presented below.

Building preparedness through practice in Myanmar

In Myanmar, ADPC worked with the Department of Meteorology and Hydrology and the Relief and Resettlement Department to strengthen early warning systems in the country's coastal belts.

HD FIRE PROTECT

Our Global Philosophy of growth is summed up in one word Trust
Serving over 50 countries worldwide

Manufacturing Excellence
Superior Performance
World-class Fire Fighting Products

HD FIRE PROTECT PVT. LTD.
D-6/2, Road Number 34, Wagle Estate, Thane 400604, India
Tel: +(91) 22 25182600 Fax: +(91) 22 25182602 Email: info@hdfire.com www.hdfire.com

intersec
17 – 19 January 2016 | Dubai
Visit us at our Stand E24, Hall 2

e2S.com/callpoints

As you would expect from the world's leading independent signalling manufacturer, we offer the widest range of products and the fastest delivery anywhere in the world.

Visit us at
AUSTRALASIA OIL AND GAS
24-26 Feb
Perth

Image courtesy of Rishiraj Dutta

◀ Responders bring relief supplies to people evacuated due to riverine flooding during an emergency simulation in Toungoo township in Myanmar.

The regional project was funded by the ESCAP Trust Fund for Tsunami, Disaster and Climate Preparedness and it provided ADPC an opportunity to conduct simulations and drills to test the readiness of the areas' early warning systems and build awareness of their importance.

"It is useful to see how coastal communities in Myanmar are preparing themselves by utilizing the warnings and forecasts provided by our department. This is a useful learning experience towards a people-centric end-to-end early warning system in Myanmar," said Dr. Hrin Nei Thiam, Director General of the Department of Meteorology and Hydrology.

ADPC designed the project activities in consultation with the government, pilot townships, village administrations and local communities, who all provided insights into the existing community-based early warning systems and their gaps.

Several key developments took place during the process including connecting the national and state level to better communicate early warning messages, which had been identified as a gap in the past. Early warning messages from the Department of Meteorology and Hydrology were enhanced to make risk-related information more accessible and understandable at the community-level. Also, awareness was created among the communities about minimum standards and procedures that they need to follow to identify safe evacuation sites. This knowledge can be applied in different areas in hopes that safe zones can be identified when needed.

Improving early warning systems through policy strengthening in Cambodia

During Typhoon Ketsana in 2009, it became apparent that Cambodian provinces did not have the tools and capacity required for a timely delivery of life-saving information to authorities and residents in local communes. This confusion caused increased losses of life and damages to property.

In the aftermath of the disaster, and as part of the Ketsana Emergency Reconstruction and Rehabilitation Project led by the World Bank, ADPC provided technical assistance to the National Committee for Disaster Management of Cambodia in addressing the gaps in the country's early warning system. Together with ADPC, the National Committee for Disaster Management developed a roadmap to establish a multi-hazard early warning system within their proposed Disaster Management Information Center.

ADPC conducted gap assessments that found inconsistencies in disaster data, characterized by poor availability and a lack of historical records. Stakeholders also had limited opportunities to access, share and effectively use the existing data to generate risk information and knowledge, and the specific roles and responsibilities of different actors in emergencies were still to be defined.

From ADPC's recommendation, the National Committee for Disaster Management established official communication protocols with its technical partners. A royal decree now requires for the National Committee for Disaster Management to enter into bilateral and multilateral agreements to enable effective coordination with its stakeholders and make them accountable for upholding the communication protocols. It also gave the National Committee for Disaster Management the authority to fill the gaps and meet the requirements of good weather services provided by early warning systems by upgrading its existing instruments, improving the observation quality, keeping record of good-quality data and proper monitoring and forecasting systems.

"We have seen improvement in the commitment to disaster risk management. However, gaps and threats still remain and we need to strengthen the system and develop capacities to make the system more effective. We need technical assistance in identifying the local risks and vulnerabilities as well as their impacts on different sectors and response programs," said H.E. Ross Sovann, Deputy Secretary General, National Committee on Disaster Management.

The importance of an informed community

Early warning systems give communities the ability to make risk-informed decisions in disaster situations. This information is crucial because it makes people aware of the need to keep themselves and their loved ones safe during a disaster.

While little can be done to prevent the increased frequency of natural disasters, informed populations can lessen disaster impacts. By doing this, we can help reduce the loss of life disasters cause and help promote best practices for future generations to follow.

For more information, go to www.adpc.net

MCH-6/EM
DRIVEN BY:
SINGLE-PHASE ELECTRIC MOTOR
CHARGING RATE:
100 L/min 6 m³/h
DIMENSIONS:
HEIGHT 35 cm
WIDTH 65 cm
DEPTH 39 cm
DRY WEIGHT: 39,5 Kg

MCH 16 ET COMPACT
DRIVEN BY:
THREE-PHASE ELECTRIC MOTOR
CHARGING RATE:
315 L/min 19 m³/h
DIMENSIONS:
HEIGHT 88 cm
WIDTH 92 cm
DEPTH 61 cm
DRY WEIGHT: 187 Kg

MCH 16 ET STANDARD
DRIVEN BY:
THREE-PHASE ELECTRIC MOTOR
CHARGING RATE:
315 L/min 19 m³/h
DIMENSIONS:
HEIGHT 63 cm
WIDTH 83 cm
DEPTH 43 cm
DRY WEIGHT: 100 Kg / 220.4 lbs

COLTRI ASIA PACIFIC
MADE IN ITALY

COLTRI ASIA PACIFIC Co., Ltd.
Free Zone at 304 Industrial Park 2 No. 94/5, Moo. 3, T. Khao Hin Sorn,
A .Phanomsarakarm, Chachoengsao 24120 Thailand
Tel: + 6638855103 to 5 Fax: + 6638855106 mobile +66818092311
robin@aerotecnicacoltriasiapacific.com
www.aerotecnicacoltriasiapacific.com

AEROTECNICA COLTRI® S.p.A.
via dei Colli Storic i 177 5010 San Martino della Battaglia Brescia - ITALY
Tel: +39.030.99.103.01 +39.030.99.102.97 Fax: +39.030.99.10.283
www.aerotecnicacoltri.it

NEW

BAT fan

Portable battery-mounted fan for self contained operation

- **2 models:**
  - 20 min runtime 23.5 kg
  - 45 min runtime 27.5 kg
- Runs also on mains electricity

- **New NEO concept for better performance:** 24 050 m³/h
- **Compact & mobile**
- **PPV Multi-use**

www.leader-group.eu

LEADER®

Include Social Media in Every Disaster Preparedness Kit

As more and more people use social media to connect and share, we have seen that in times of disaster, people turn to Facebook to get information about what's happening around them and to check whether their friends and family are safe.

Marcy Lynn

Mia Garlick

Throughout the Asia-Pacific region, we see hundreds of millions of people regularly connecting and sharing via Facebook each month, making it a powerful tool to assist friends, family, communities and organisations to prepare for, respond to and recover from disasters.

At Facebook, we want to help amplify how we see people using our platform in times of crisis, to make it easier for them to find what they need – information, support or supplies – and offer assistance to others. We have developed a number of tools and resources, like our Safety Check feature, donation campaigns and the Facebook Prepare and Respond Guide, which aim to do this.

Safety Check

Time and again during disasters, we have seen our services become an effective way to communicate with loved ones, particularly when large numbers of people are affected.

This was evident during the devastating 2011 earthquake and tsunami in Japan. According to the Japanese Red Cross, more than 12.5 million people were affected nationwide, and more than 400,000 people were evacuated. During that crisis we saw how people used technology and social media to stay connected with those they cared about. It is in these moments that communication is critical for people in the affected areas and for their friends and families anxious for news.

Our engineers in Japan took the first step toward creating a tool – Safety Check – to make it easier to communicate with others.

Safety Check, which is available globally on Android, iOS, feature phones and desktop, provides a simple and easy way for an individual to let their friends and family on Facebook know they are safe, and it allows friends and family to check in to see if their loved ones in an area affected by an emergency are safe.

Facebook decides to activate Safety Check based on criteria about severity and type of incident, and in consultation with relevant government agencies in the affected area. We also work closely with local government authorities to identify if the tool can be helpful during an emergency.

To date we have activated Safety Check for four natural disasters – after

▼ **Examples of Facebook Safety Check in action.**

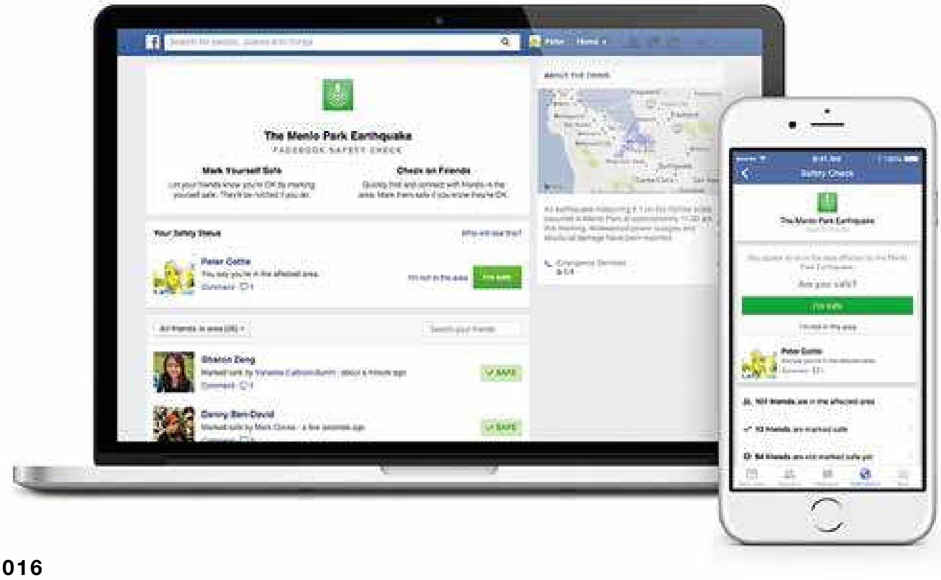


Image courtesy of Marcy Lynn

Marcy Lynn, Programs Manager on the Facebook Crisis Tools Team.

Mia Garlick, APAC Regional Co-ordinator on the Facebook Policy Team.

Typhoon Ruby in the Philippines, in the wake of Cyclone Pam, following the Nepal Earthquakes, and most recently in response to the earthquake in Chile. To date, millions of people have used Safety Check to mark themselves safe, and hundreds of millions more friends and family have been notified that their loved ones were safe. And we've seen countless expressions of love, gratitude and relief for this information, confirming how impactful social media can be in times of disaster.

Donation campaigns

In addition to people turning to our services to reach friends and family and receive news and information about a disaster, we also see people turn to Facebook to try to help those impacted.

To make it easier for people to help, we have deployed several donation campaigns that invite the Facebook community to donate to organizations assisting people impacted by a disaster. Facebook targets users directly at the top of their Newsfeeds, and provides a link that, when they click through, allows them to donate directly to an organization without ever leaving Facebook.

We have activated donation campaigns in the wake of Typhoon Haiyan in 2013, in response to the Ebola crisis in Africa in late 2014, after the Nepal Earthquakes, and most following the devastating floods in Myanmar in July 2015.

Our largest donation campaign was in response to the 2015 Nepal Earthquakes. In just 60 days, the Facebook community responded generously to the campaign with more than 750,000 people donating $15.4M dollars to support earthquake survivors. All of the money raised went to the International Medical Corps to support relief and recovery efforts on the ground. Facebook provided a matching donation of an additional $2M, which is being disbursed through Give2Asia to local organizations working on ongoing rebuilding efforts in Nepal. You can view a short video that thanks all those who donated and show how their donations were being used to help people in Nepal on the Facebook Page (https://www.facebook.com/facebook/videos/10154085994656729/).

Prepare and Respond Guide

Throughout the world, we have been learning how organisations like American Red Cross, World Food Program USA, the New South Wales Rural Fire Service and Federal Emergency Management Agency use Facebook as part of their disaster response strategies.

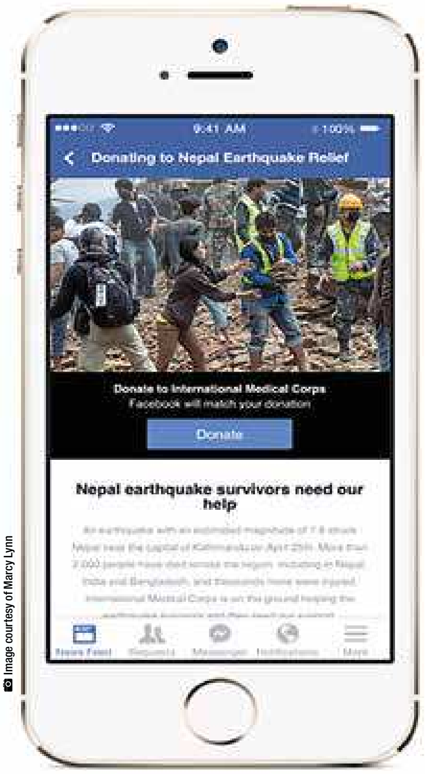
These organisations employ Facebook in a variety of ways, from providing tips on keeping people and property safe, sharing important updates as a storm front or fire approaches, or rallying people to help others after disaster strikes. An example of this in New Zealand are the Student Volunteer Army who took to Facebook to help others, particularly the elderly, in the wake of the devastating Christchurch earthquake in 2011. Another example was in Japan, following the Great East Japan Earthquake in 2011, many organisations such as the Japan Bousaishi (disaster prevention specialists) Society turned to Facebook to share useful information such as disaster drills, disaster prevention workshops, and calls-to-action across the island nation.

To assist individuals, communities and organisations maximize the impact of their outreach and engagement on Facebook, we developed the 'Prepare and Respond' Guide, which is a collection of worldwide best practice to connect with others and better prepare for and respond to natural disasters. The guide offers tips and case studies on how to maximise the impact of Facebook Pages, which are the foundation for a two-way communication with the community of people interested in your work.

The different features of Facebook Pages – like Timeline, Cover and Profile Photos, and the About section – allow your organisation to inform and engage members of the public as well as employees or volunteers from other stakeholders.

To take one example – Pages – the Guide provides tips about how organisations can manage their Page posting strategy to provide people with the information they need before, during and after a disaster.

- Before: Create a Page posting strategy designed to keep people informed in advance of any disasters. Regularly posting helps your organisation stay front of mind as a credible and reliable resource during disasters. For example, post relevant tips to remind people of the steps they can take to keep themselves and their family prepared for a disaster that can strike at any time, like an earthquake, or impending severe weather or flooding.



Donate to International Medical Corps
Facebook will match your donation

Nepal earthquake survivors need our help

Image courtesy of Marcy Lynn

▲ **Facebook's Nepal donation megaphone.**

- During: Timing is crucial – post regularly with photos and videos, share links to more in-depth information, and, when appropriate, target posts to people in specific locations. Respond to questions and feedback in the comments sections of your posts.
- After: Post direct and clear information about where community members can receive assistance and how they can help in the recovery effort through donations or volunteer opportunities.

Ensuring that they have a Page posting best practice strategy on how to best use Facebook can allow community groups, government organisations and other front line responders engage the public and help people stay informed.

You can obtain a copy of the Prepare and Respond Guide at the Disaster Response in the resources section of the Disaster Relief on Facebook Page (https://www.facebook.com/disaster) that we manage. You can also like the Disaster Relief Page for keeping track of tips and tools fro around the world related to disaster management and response. We hope you never need it!

For more information, go to www.Facebook.com/disaster

The Power of Debrief – From Chaos to Synchronicity

With the growing complexity and intensity of disaster incidents, both natural and human-caused, the need to continuously review and improve is becoming a strategic and operational imperative for emergency services organisations.

Brenda Leahy

As factors such as extreme weather and continued urban expansion into fire-prone landscapes increasingly converge to create 'VUCA' (volatile, uncertain, complex and ambiguous) events, the challenge is to build capability and agility to anticipate, and contend with, each new and different scenario.

One avenue, according to research, is through organisational learning – creating the opportunities and conditions for agencies, their teams and individuals to learn and to think differently, critically, strategically and innovatively about their performance and impact.

Agencies continue to invest in developing their people and operational capability, but increasingly recognise the need to do more, according to Dr Christine Owen, an internationally published authority on incident management and researcher for the Bushfire and Natural Hazards CRC and the former Bushfire CRC. In a recent survey, AFAC member agencies identified key professional development areas to support and improve incident management capability for the industry. These areas were how to effectively facilitate debriefs, conduct staff rides for organisational learning, optimise the use of simulations for learning, make decisions under pressure and manage in adversity.

The results of the survey, conducted as a research utilisation initiative, contributed to the launch of a suite of practical evidence-based resources for AFAC members, together with a series of professional development events, designed to maximise use of these learning resources. Delivered in webinar and face-to-face format, the series has been rolled out since April this year in several jurisdictions under the banner of Building AIIMS Capability Roadshow.

One information resource in the series is the Debrief Resource Pack, a collection of three publications: *Conducting successful debriefs – research insights into good practice, Conducting successful debriefs – a handbook for facilitators and Conducting successful debriefs – a field guide* and *aide memoire*.

The background research publication provides a comprehensive picture of currently available published literature on debriefing internationally, and a synopsis of Bushfire CRC research conducted over the past 10 years.

The resource also captures some insights and perspectives of the sector through AFAC's Learning and Development Group, and identifies implications for practitioners.

According to Dr Owen, the project's research team leader and editor, debriefing provides powerful opportunities to learn, review performance, reframe problems and integrate the outcomes into organisational and operational processes and practices.

"It is a critical part of the cycle of continuous improvement within the emergency management environment," she explained. And while there has been a recent, positive shift towards its use, for example after action reviews of training exercises, the research shows there is opportunity to enhance experience with debriefing.

"Where well managed, the debrief process, rather than the exercise itself, affords the greatest opportunity for learning to occur," Dr Owen said.

"Although reflection after a learning experience might occur naturally, it is likely to be unsystematic. And there is the possibility that it may not occur at all, especially where the pressure of events prevents people from focusing on what has just transpired.

Brenda Leahy is Communications Officer Research Utilisation at AFAC.

"Conducting formal debriefing focuses the reflective processes, both for individual participants and for the group as a whole."

According to Dr Owen and co-researchers Dr Ben Brooks, Dr Peter Hayes and Debbie Vogel, the research, synthesised from across multiple scientific disciplines, indicates that effective debriefing has a range of benefits for individuals, teams and organisations. Benefits included encouraging deeper processing of knowledge and insights, as well as effective transfer of learning.

The researchers cite a 2014 meta-analysis of research by US academics Scott Tannenbaum and Chris Cerasoli, which showed that debriefing, conducted over about 18 minutes, had the potential to improve operational and team effectiveness by 25% compared to a control group. The meta-analysis was based on 46 research studies of debriefings with an aggregate sample population of 2,136 people.

"Amongst the studies reviewed, it was found that this improvement in effectiveness was similar, regardless of whether they compared teams or individuals, simulated or real settings, group designs or different work domains. The effect of aligning groups or individuals and also improving the structure of the debrief increased the effect size."

According to Dr Owen, facilitators are critical to the effectiveness of the debriefing process. Facilitators need to be clear about the aims of a debriefing, while applying a structure and focus that maximises individual, team or organisational learning.

"The theory underpinning learning from the debrief is that in order to maintain the developmental intent, it is necessary to develop a climate of critical reflection where it is possible to examine gaps in understanding at the individual, team and organisational levels."

According to the researchers, the critical elements for facilitating reflection are ensuring the following questions are answered:

- What was planned?
- What really happened?
- Why did it happen?
- What can we do better or differently next time?

Image courtesy of CFA Communities and Communication

▲ **How to effectively facilitate debriefs is a key area for professional development.**

"While these questions seem relatively straightforward, the role of the facilitator is critical to ensure that participant responses do not remain superficial and participants are able to drill down into their experiences, warts and all," Dr Owen said. "This is not that easy."

One study, which examined simulation-based learning, reported that half the participants in a simulation exercise found debriefing to be stressful and intimidating. A similar proportion cited a fear of judgement by their peers.

"Facilitators need to help the group create shared meaning from what happened and then to move into an analytical why-did-this-happen phase," Dr Owen said. "For some groups this can be quite challenging. The purpose of the clinics in the Building AIIMS Capability Roadshow is to help facilitators hone these skills."

The practice of debriefing has long been a critical facet of military operations.

According to AFAC's Director of Operations Support, Paul Turkington, debriefing is fundamental to refining operations as they unfold, and as a post-incident mechanism for continuous review and improvement.

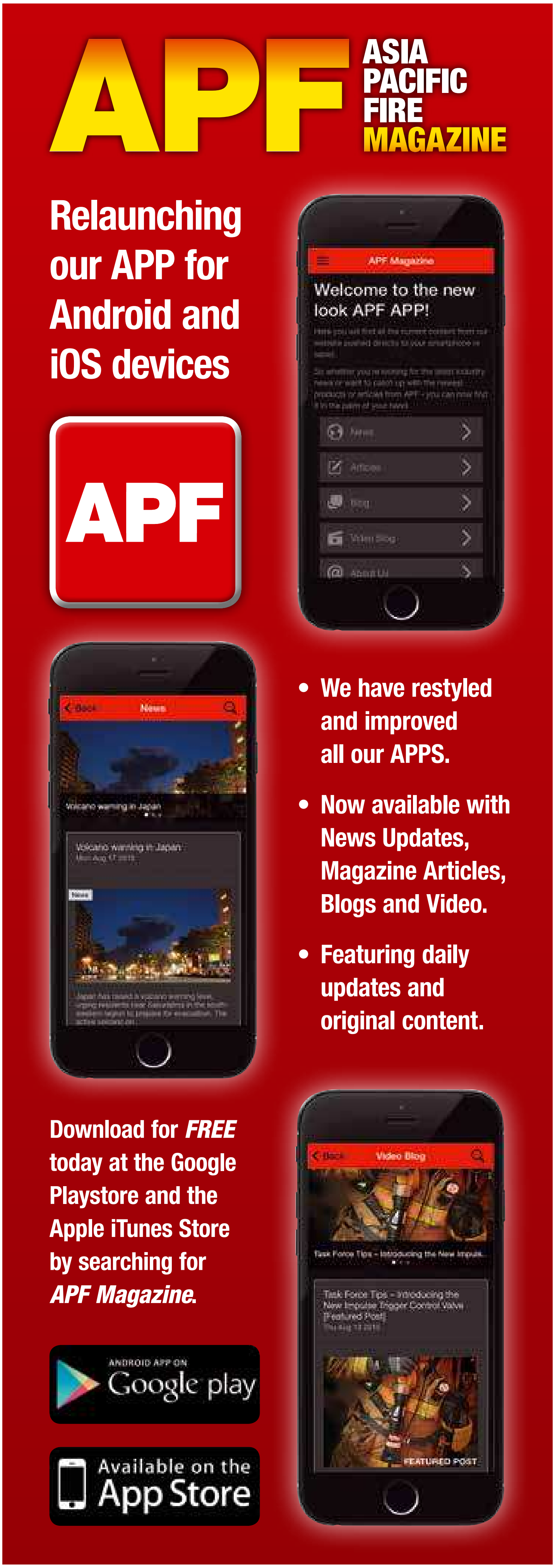
"The more complex and chaotic the incident or emergency, the more critical the need to debrief," Mr Turkington explained, drawing on his military background and operational experience. In some situations, the method involves 'live', rolling debriefings to review and refine operations in pursuit of a successful outcome. Debriefings are also run as a matter of course within a relatively short time after an assignment or incident to ensure learning opportunities are analysed and integrated into relevant organisational processes and operations. In post-event situations, everyone involved in the assignment is included, from logistics and finance through to senior command. "The key is that everyone can and does contribute constructively with a view to improving performance."

Mr Turkington said debriefing was an essential strategic and tactical tool in complex and chaotic environments.

"Just as an operation in Iraq is complex, uncertain and chaotic, so too is an extreme bushfire such as Black Saturday," he said.

"While these events are dynamic and uncertain, debriefing is one tool that enables synchronicity – the marshalling of resources into a common framework so you can continue to move forward whilst everything is in chaos."

For more information, go to www.afac.com.au



APF ASIA PACIFIC FIRE MAGAZINE

Relaunching our APP for Android and iOS devices

APF

- We have restyled and improved all our APPS.
- Now available with News Updates, Magazine Articles, Blogs and Video.
- Featuring daily updates and original content.

Download for ***FREE*** today at the Google Playstore and the Apple iTunes Store by searching for ***APF Magazine.***

ADVERTISERS' INDEX

3M Fire Protection Products	33
Advanced Electronics	04
Bauer Compressors Asia Pte. Ltd	13
Bio-Ex S.A.S.	25
Bristol Uniforms Ltd	49
Bullard Asia Pacific	70
Coltraco Ultrasonics	06
Coltri Asia Pacific Co. Ltd	83
Cutters Edge	50
Dafo Fomtec AB	22
Dr. Sthamer Hamburg	27
Dynax Corporation	29
E2S	81
Emergency Services Foundation	69
Exova Warringtonfire Aus Pty Ltd	17
FFE	25
Fire Protection Association Australia	17
Firetrace International	57
HD Fire Protect Pvt Ltd	81
Holmatro Rescue Equipment	37
Leader S.A.S.	83
LHD Group Hong Kong Ltd	44/45
MDM Publishing Ltd	38
NewAge Fire Fighting Co. Ltd	63
Pacific Helmets (NZ) Ltd	74
PAB Akrapovic	64
Performance Advantage Company	09
Reliable Fire Sprinkler (UK) Ltd	02
Safe Fleet	26
Saphire Complete Training Concepts	73
Sicor S.p.A.	78
Super Vacuum Manufacturing Co., Inc.	43
Task Force Tips, Inc.	IFC / 01
Teikoku I-Sen Co.	41
Tempest Technology Corporation	69
Texas A & M Emergency Services Training Institute	73
The Chemours Company	IBC
The Protectowire Co., Inc.	11
TLX Technologies	13
Tyco Fire Protection Products	OBC
Waterax	15
Yone Corporation	34
Ziamatic Corporation	43

Come and see us at

intersec
17-19 January 2016 • Dubai, UAE

Fire Safety Asia
24-25 February 2016 • Kuala Lumpur, Asia

FIREAUSTRALIA + HAZMAT
4-5 May 2016 • Melbourne, Australia

www.mdmpublishing.com

When asset protection matters most. FM-200™.

FM-200™ clean agent can reach extinguishing levels in 10 seconds or less, stopping ordinary combustible, electrical, and flammable liquid fires before they cause significant damage. When fire is extinguished that quickly, it means less damage, lower repair costs, and an extra margin of safety for employees and valuable assets—making it easier to keep your business running smoothly.

Make sure your business is protected with the most widely specified clean agent in the world. Get maximum protection with FM-200™.

1.800.473.7790 ▪ cleanagents.chemours.com

Fire Extinguishants by Chemours.
The Science of Protection.

FM-200™

Chemours™

Chemours™ and the Chemours Logo are trademarks or registered trademarks of The Chemours Company. FM-200™ and the FM-200™ Logo are trademarks or registered trademarks of The Chemours Company, and its affiliates.

www.ansul.com

ASIA PACIFIC SALES OFFICES

Singapore ▪ Beijing ▪ Guangzhou ▪ Shanghai ▪ Wuhan ▪ Busan ▪ Seoul ▪ Taipei ▪ Hong Kong
Jakarta ▪ Bangalore ▪ Mumbai ▪ New Delhi ▪ Brisbane ▪ Melbourne ▪ Perth ▪ Sydney ▪ Christchurch

DISTRIBUTION

Everywhere

CONTACT US AT info.apac@tycofp.com

APF

ASIA PACIFIC FIRE MAGAZINE

REPORTING TO THE ASIA PACIFIC FIRE PROTECTION AND FIRE SERVICE INDUSTRY

MDM
PUBLISHING LTD
WORLDWIDE MEDIA

www.apfmag.com
Issue 57 • April 2016

Fixed Station and Portable Monitors • Master Stream Nozzles • Self Educting Foam Nozzles • LDH Hardware, Manifolds, Intake and Discharge Valves • Hazardous Location Monitors

Industrial Fire

FM
APPROVED

NFPA #1964
Compliant

Nozzles • Valves, Wyes and Tees • Foam Equipment and CAFS Nozzles • Bumper Mount Monitors • Tools and Accessories

Wildland Fire

Intake Valves • Jumbo Wyes, Siamese and Gated Manifolds • Hydrant Assist Valves • Gated Wyes and Water Thiefs • Suction Hose and Strainers

Water Supply

Fixed, Selectable and Automatic • Standard, Low and Dual Pressure • Smooth Bores and Ball Valves • Pressure Gauges and Flow Indicators • Specialty Nozzles & Accessories

Handheld Nozzles

Fixed and Remote Control Monitors and Nozzles • Intake Valves, Adapters, Elbows and Fittings • Monitor Manifolds • Tools and Accessories

Fire Apparatus Equipment

TFT®
TASK FORCE TIPS®
FIRE FIGHTING EQUIPMENT

G-Force™

Foam Nozzles and Attachments • Eductors • Self-Educting Nozzles • Foam Injection and Application Systems

Foam Equipment

MADE IN USA 🇺🇸

3701 INNOVATION WAY
VALPARAISO, IN U.S.A.

+1.219.548.4000

www.tft.com • www.newforce.tft.com

by: TASK FORCE TIPS 🇺🇸

QuickZone

The Advanced
Conventional Fire System

QuickZone is the new conventional and twin-wire system from Advanced. As you'd expect from the name it's quick on the wall, quick to configure and quick to maintain.

Available in basic and feature-rich panel formats covering 2-32 zones, it is ideal for any conventional installation.

Programming of zones, inputs and outputs is highly flexible and false alarm management is included.

To make life really easy it comes with our legendary Advanced360 service and support.

Contact Advanced now for a demo, brochure or sales information. www.advancedco.com

Advanced
The Standard in Fire Systems

Dubai Office
Dubai Airport Free Zone, Building W3,
Office 211, Dubai UAE
Tel: +971 4 299 0908
Fax: +971 4 299 0554

UK and EMEAA HQ
Moorland Way, Cramlington,
Northumberland, NE23 1WE UK
Tel: +44 (0)1670 707 111
Fax: +44 (0)1670 707 222

Advanced

Email: sales@advancedco.com **Web:** www.advancedco.com

APF
ASIA PACIFIC FIRE MAGAZINE
REPORTING TO THE ASIA PACIFIC FIRE PROTECTION AND FIRE SERVICE INDUSTRY
MDM PUBLISHING LTD WORLDWIDE MEDIA
www.apfmag.com
Issue 57 • April 2016

APRIL 2016 • ISSUE 57

Cover image: When foam applications are required, the QuadraCup selectable gallonage nozzle can provide a far reaching straight stream, wide protective fog pattern, or aspirated finished foam with the simple twist of the protective front bumper.
Image courtesy of Task Force Tips.

Publishers
Mark Seton
David Staddon

Editor
Neil Bibby **ASFM, FAICD, MIFireE**
neil.bibby@mdmpublishing.com

Contributing Editors
Desmond Bahr, Howard Colvin, Jane Embury, Andrew Gissing, Mark L. Gribble, Dawn Hendrick, Peter Lucas, Nathan Maddock, John McAneney, Craig H. Shelley, Gary Parkinson, Paul Somerville, Jamie Storrie, Sue Tarantino, Ken Taylor, Anthony Walker, Tim Wheeler, Duncan J. White, Scott Williams, Mike Willson.

Design Manager
Richard Parsons
richard.parsons@mdmpublishing.com

Web and IT Manager
Neil Spinney
neil.spinney@mdmpublishing.com

International Sales
Mark Seton
mark.seton@mdmpublishing.com

Mark Bathard
mark.bathard@mdmpublishing.com

Dave Staddon
dave.staddon@mdmpublishing.com

APF is published quarterly by:
MDM Publishing Ltd
The Abbey Manor Business Centre,
The Abbey, Preston Road,
Yeovil, Somerset, BA20 2EN, UK.
Tel: +44 (0) 1935 426 428
Fax: +44 (0) 1935 426 926
Website: www.mdmpublishing.com

MDM Publishing Ltd (Australia)
23 Richardson Street, Lane Cove,
NSW 2066, Australia.
Tel: +61 (0) 418 358 465

©All rights reserved

ISSN – 1476-1386

DISCLAIMER: The views and opinions expressed in ASIA PACIFIC FIRE are not necessarily those of MDM Publishing Ltd. The magazine and publishers are in no way responsible or legally liable for any errors or anomalies made within the editorial by our authors. All articles are protected by copyright and written permission must be sought from the publishers for reprinting or any form of duplication of any of the magazines content. Any queries should be addressed in writing to the publishers.

Reprints of articles are available on request.
Prices on application to the Publishers.

Designed, Edited and Printed in the UK.

***FREE* Subscription**
To subscribe to APF Magazine and for unlimited access to our digital resources, please register at www.apfmag.com

PROUD TO BE A MEMBER OF
CFPA-Asia

Contents

APRIL 2016

REGULARS

5 Editors Comment
7 Industry Comment
8 News and Profiles

FEATURES

27 Aspects of foam need careful consideration – Part 2
33 Petroleum storage tank facilities – Part 3
38 Multi-agency (Integrated) CBR capability
42 The Bridge of Sighs and evacuation models
47 Taiwan earthquake update
50 Monitoring practices of firefighter safety when working in the heat
54 Use of unmanned aerial vehicles for emergency communications
57 Smart devices are transforming door to door field operations
61 Update on key fire standards
64 Smartphones and sky scans for better fire mapping
69 What is your firefighting philosophy?
75 Planning for catastrophic disasters
78 Advanced incident management with ESIC
82 The response to maritime environmental emergencies: A multi-sectoral approach

33

47

78

82

facebook LinkedIn twitter Google+

COLTRACO
Ultrasonics | since 1987

Are your fire suppression systems protected against discharge 24/7, 365 days a year?

LISTED

PORTALEVEL™ MAX
Handheld ultrasonic liquid level indicator
Accuracy: +/-1.5mm
IS/ATEX coming soon

PERMALEVEL™ MULTIPLEX
Continuously monitor up to 700 cylinders ultrasonically
Total visibility 24/7, 365 Remote diagnostics Remote monitoring

PERMALEVEL™ LOAD WEIGH
Mechanical continuous CO2 monitoring system
Simple | Efficient | Low cost

For CO2, FM-200®, Novec™ 1230, FE-13™, FE-25™ & FE-36™, HFC227™

Have peace of mind your critical assets are safe from anywhere in the world

Meet us:
NAFED
Las Vegas, March
Atlantic City, April
Indianapolis, May
NFPA MEMBER 2015-2016
Las Vegas, June

46 Mount Street Mayfair London UK | www.coltraco.com
Call +44 207 629 8475 or email sales@coltraco.co.uk

Let’s not forget the Pacific

The Pacific islands are a large part of our readership and present a marketing opportunity to those that know how to deal with the islands’ culture and systems.

Neil Bibby
AFSM, FAICD, MIFireE
Editor

The islands are divided into three broad groups:

- Micronesia which includes the Marshall Islands and Kiribati
- Melanesia which includes New Guinea, Fiji and New Caledonia
- Polynesia which includes New Zealand, Samoa, Tonga and Cook Islands

The World Bank has identified that of the 20 countries in the world, with the highest average disaster loss, scaled by GDP, eight are in the Pacific. These are also the most vulnerable countries in the world to be affected by climate change.

In this environment the Pacific island nations need services, products and knowledge to assist them to prepare for, deal with, and recover from, the disasters that will inevitably impact them. Many of those in industry are of the view that there are few funds available to spend on these safety products and/or securing infrastructure. In many ways that is correct, army, fire and police services are supported by first world countries but this does not mean they are living on hand-me-downs, government and private sectors are purchasing state-of-the-art equipment.

How can this be? If you look at the metrics you will see that PNG, Fiji and Solomon Islands have significantly increased their exports, tourism is on the increase across the Pacific because of instability in other parts of the world. Pacific islands are using lateral ideas to increase GDP, an excellent example of this is Tuvalu gaining significant foreign exchange by selling its internet suffix “tv” to international television networks. GDP in some pacific nations outgrowing first world countries for example PNG growth in 2014 was 8.4% and Fiji 5.3% and a further indicator is the uptake in smart phones which has seen a doubling of phone ownership in the last five years.

There is also significant aid flowing into the islands from the USA, Japan, the EU, China and Australia. This aid is in-part for emergency services and protecting the local community and tourists.

The Pacific Agreement on Closer Economic Relations (Nov 2015 update) includes provisions for security and resilience. The World Bank approved in June last year, US$32.29m for an international development assistance grant for disaster reduction. There was also US$62m for aviation safety including fire and rescue equipment in Dec 2011. There are funds available for those that search for them.

Why am I telling you this? It’s because the Pacific is no longer a place that looks only for hand-me- downs (although many first-world pieces of kit are still viable and welcome). The island nations of the Pacific can purchase modern equipment and services in all areas of disaster management from making communities and industries resilient to events, protecting the community and critical infrastructure during an event, as well as moving quickly to recover from disasters.

In summary there are opportunities in the Pacific Islands for those that put some time into researching their needs as to where the money could come from.

The World Bank has identified that of the 20 countries in the world, with the highest average disaster loss, scaled by GDP, eight are in the Pacific. These are also the most vulnerable countries in the world to be affected by climate change.

Neil can be contacted at
neil.bibby@mdmpublishing.com
or via LinkedIn – Neil Bibby.

FIRETRACE®
POWER TO INNOVATE. FLEXIBILITY TO ADAPT.

WHATEVER THE HAZARD,
WE'VE GOT YOU COVERED

PRE-ENGINEERED SYSTEMS FOR SMALL SPACES:
- Detect and suppress fires automatically
- Reacts 10x faster than conventional systems
- Compatible with most extinguishing agents

UL LISTED FM APPROVED
Listings and approvals vary by agent and system type

ENGINEERED SYSTEMS FOR LARGE SPACES:
- High-pressure performance in a low pressure system
- Unparalleled flexibility in system design and placement
- Cylinder sizes ranging from 35lbs to an industry leading 1300lbs using 3M™ Novec™1230

LEARN MORE AT: www.firetrace.com
A HALMA COMPANY

FIRETRACE INTERNATIONAL - WORLD HEADQUARTERS
8435 N. 90th St., Suite 2, Scottsdale, AZ 85258, USA.
Tel: +1 480 607 1218 • Email: info@firetrace.com

FIRETRACE INTERNATIONAL LTD - EMEA OFFICE
Unit 11, IO Centre, Salbrook Road, Salfords, Surrey, RH1 5DY, UK.
Tel: +44 (0) 1293 780 390 • Email: info@firetrace.com

Delivering on our 2020 vision – simplifying accreditation

FPA Australia has a simple goal for the fire protection industry: that all individuals will be 'fit-for-action' (which means trained, competent and accredited) by2020. We are committed to making this goal a reality and have listened to feedback from our members in order to make the training and accreditation process simpler and more affordable.

Scott Williams
CEO – FPA Australia

We recognise the cost of accreditation can be a barrier – so we have removed most of the costs. The Association is removing fees associated with transitional accreditation (inspect and test) and business recognition for all Corporate members. This means you can obtain transitional accreditation for all of your inspect and test technicians right now, free of charge.

The Association also understands the cost of training can be prohibitive, so we are now offering a major subsidy. While you are free to choose the most cost-effective training provider to suit your needs, FPA Australia is now subsidising 40% of the cost of inspect and test training in order to ensure we can deliver on our 2020 Vision outlined above.

To ensure the success of our accreditation programs we need to partner with the entire industry and the community and actively promote the use of accredited individuals. The success of these important initiatives depends on the support of stakeholders at all levels, both within the industry as well as brigades, councils, regulators, facility managers and everyone with an interest in fire protection and life safety.

In order to demonstrate our commitment to accreditation as the only pathway to professionalising the fire protection industry, in future, only FPA Australia Corporate members who employ accredited technicians will receive promotion as "providers of choice" on the Association's website and in other promotional materials.

In 2016 some of the largest and most influential fire protection businesses in this country will be joining FPAS, bringing with them hundreds more technicians who will become qualified FPAS individuals. This is absolutely a win-win for the industry and the community as more qualified individuals means more choice for consumers and ultimately, improved fire safety outcomes.

This will also mean an increasingly competitive environment with those companies that have taken up FPAS advantaged by being able to leverage their commitment to quality and training in advertising, tenders and contracts. For too long simply being the cheapest option has often been the determining factor for fire protection companies being selected for work. This must change. We see a future where businesses employing trained, skilled, competent and accredited individuals are the preferred option for major fire protection works and FPAS will be critical in achieving this.

The next major step in our accreditation program will be the official launch of the fire systems design and fire systems certification classes which have taken significant time and resources to develop. This development has included the creation of dedicated skills assessment workshops, resources and questionnaires. Once these classes of accreditation are rolled out, the next focus will be on accrediting individuals undertaking emergency planning and training work. In time it is expected that all major areas of fire protection work in Australia will be covered by an accreditation program administered by FPA Australia. And we're not stopping with just people.

The quality and compliance of building products which have an impact on the fire safety of occupants is a major focus of FPA Australia. The Association believes a comprehensive national listing scheme for such products is required and the Association is working with the relevant stakeholders to determine how such a system might be administered in future.

On behalf of our Association and the Board of Directors I ask you to support our efforts to improve the industry right now, by only using and recommending accredited individuals for the inspection and testing of fire protection work in Australia.

Recognising and promoting businesses committed to best practice is the best way we can achieve good life-safety outcomes and deliver on our vision to lead and support a professional industry, to minimise the impact of fire on life, property and the environment, for a safer community. Thank you for taking the time to consider these important initiatives and please enjoy reading this edition of *Asia Pacific Fire* magazine.

For more information, go to www.fpaa.com.au

News

Interactive touch screens speed up and improve your emergency response

Fast information access and dissemination is key to a successful emergency response. Every second counts when reviewing key information and communicating decisions consistently to local and remote teams.

New touch screen hardware and software technologies enable operations centres to be fitted out with intuitive collaboration tools, providing a common operating picture to multiple stakeholders. Meeting tables can be turned into large interactive screens, enabling multiple users to be working together, seamlessly communicating information to teams in a variety of locations.

Cruiser Interactive produces software that leverages this new touch screen hardware by providing tools to easily visualise and collaborate with information across touch screen devices throughout your organisation. Users can seamlessly flick content to surrounding screens, walls and tables for immersive collaboration. Information captured in the field can be easily shared to a touch table in the operations centre. Similarly, decisions and briefings can be quickly conveyed to people remotely, flicking content to their device for review.

Cruiser Interactive will be providing a full demonstration of hardware and software solutions at their stand.

Please drop by to see how collaborative touch tables can enable flexible and fast information access in your organisation.

Contact us on 02 8355 2540 or info@cruiserinteractive.com.au

For more information, go to cruiserinteractive.com.au

© Image courtesy of Cruiser Interactive

Marine Rescue – New South Wales

Marine Rescue NSW (MRNSW) is the state's official volunteer marine rescue service, committed to our mission of saving lives on the water. MRNSW is one of the largest volunteer marine rescue groups in Australasia with 45 units, over 3000 active volunteers and 82 rescue vessels – providing a 24/7 marine radio and rescue safety net across the coastline and on key inland waterways. www.mrnsw.com.au

MRNSW officially took to the water on January 1 2010, the product of a successful merger of three former rescue organisations: the Australian Volunteer Coast Guard Association, Royal Volunteer Coastal Patrol and the NSW Volunteer Rescue Association (marine fleet).

As the recognised NSW volunteer marine rescue agency, MRNSW provides the following key public safety services:

- 24/7 marine search and rescue response
- 24/7 marine radio monitoring and the provision of the states only public marine radio network
- The states only vessel log on and tracking service
- Boating safety education and advocacy

In 2014-15 MRNSW volunteers:

- Contributed over 600,000 volunteer hours to providing frontline safety services
- Responded to 3,001 vessels in distress on the water, rescuing over 5,600 people
- Logged on and proactively monitored over 70,000 vessels
- Handled over 310,000 radio calls

© Image courtesy of Marine Rescue NSW

For more information, email www.mrnsw.com.au

Leading incident management platform for Australian local governments

Crisisworks is an all-hazards, all-phases emergency and incident management system that connects your field operations with your control centre using an integrated set of modern and easy-to-use tools and technologies.

Crisisworks is the leading incident management platform for Australian local governments, and is also used extensively state governments and utilities. An affordable and integrated solution, Crisisworks has the power to handle risk, compliance, planning, emergency management and recovery for both emergency and standard business operations.

Manage business processes, share intelligence, identify and manage risks, delegate and track activities, communicate with teams and other stakeholders and manage sensitive data, all in a fully secure and audited environment.

Crisisworks is used daily for a wide range of operations including vulnerability tracking, rapid impact assessments, building assessments, environmental health assessments, community recovery, infrastructure recovery, fire prevention, weed treatment, compliance inspections, infringement notices, psychological first aid, volunteer rostering, vehicle inspections, time sheeting, expense tracking and much more.

Additionally, the underlying technology Localityworks is adaptable to meet a wide array of non-emergency business operations. Localityworks is highly configurable, and includes both cloud and mobile components and combines strong geospatial capabilities with advanced mobility, messaging, notifications, resources, assets, costs, audit and hundreds of features to provide structured data collection, team workflow and management.

Proudly developed in Australia by Datalink, Crisisworks and Localityworks are advanced and easy to use platforms for innovating business processes for today and the future.

For more information, email innovate@datalink.com.au

© Images courtesy of datalink

YONE respond to Taiwan earthquake

At 03:57 local time (19:57 UTC) on February 6th 2016, an earthquake with a moment magnitude of 6.4 struck 28 km northeast of Pingtung City in southern Taiwan, in the Meinong District of Kaohsiung, causing widespread damage and 117 deaths. Almost all of the deaths were caused by a collapsed residential building.

The rescue teams from Taiwan used YONE PROEYE 991-N nano-cam for their rescue operations. The very small camera head of nano-cam requires 7mm holes or cracks to find victims who are trapped in confined spaces.

Before inserting the camera head they use the cordless hammer drills to make holes and insert the camera head through this small hole. The rescue operations were very tough which damaged the nano-cam camera head and required urgent repair.

Yone dispatched a spare camera head via DHL to Tainan city where maintenance operations were performed immediately, so that they could continue the rescue operations.

The rescue teams were very impressed by the strong features of the PROEYE 991-N nano-cam and the level of support and customer service demonstrated by Yone.

For more information, email www.yone-co.co.jp

© Image courtesy of Yone

Advanced saves Arizona school £14,000 on fire systems update

The high level of integrity and diagnostic tools on its systems have helped an Advanced systems integrator save a client school £14,000 on a retrofit installation.

Alarm Electronics & Communications was contracted by the Flagstaff Unified School District in Arizona to update the fire detection system at Coconino High School, which opened in 1967. Having experienced two massive remodels and several lightning strikes over the years, school officials noticed during the latest remodel that the fire systems were unstable, with obsolete parts that made repairs difficult.

The job posed several unique challenges as the current system was a non-addressable 30 zone hardwired system, with some elements almost 30 years old.

"To keep track of wire length impedances and device current draws, we couldn't just go out and replace each device, connect it to a panel and auto-program," said Alarm Electronics & Communications owner, Marc Forman. "Most fire panels have limitations based on the age, type and length of wire. This campus had over 60,000 feet of traditional building wire, and besides the high cost of a complete tear-out and reinstall, we also had to keep the fire system partially running during installation because classes were in summer session."

To address these issues, the company used Axis AX intelligent fire panels from Advanced. The panel has four fully filtered, voltage regulated SLC addressable circuits that would accommodate the old wiring types and methods, as well as the sheer length of wire in the school's current system. Using the Axis AX panel, Alarm Electronics & Communications could engineer and commission the upgrade on the go. After some modifications to the 25 year-old duct smoke detectors, new equipment was retrofitted to the current hardwired system. This saved the school district approximately £14,000 ($20,000) over a new installation.

In addition to its ability to work with older fire systems, Axis AX also provided school officials with enhanced functionality and visibility over the older model fire system. The panel's diagnostics and function buttons allow complete system interrogation and control. If a problem in the system occurs, the panel can indicate the location so a technician can quickly address the issue and get the system back online.

"The Axis AX panel is one of the most – if not the most – powerful platforms for fire integration available, with outstanding diagnostics and features needed today," added Marc.

For more information, go to uk.advancedco.com

Image courtesy of Advanced

International Aviation Fire Protection Association – Asia

International Aviation Fire Protection Association (IAFPA) has recently set up a regional headquarters in Singapore to better serve the Asia Pacific region. The regional centre aims to help to promote International Civil Aviation Standards in Aircraft Fire Fighting and Rescue and to promote closer co-operation between the various Emergency Responders by interactive programmes which will be held at locations across Asia Pacific and the Middle East.

IAFPA Asia will be helmed by Cletus Packiam, Fire Chief at Airport Emergency Services (AES) at Changi Airport Group (CAG).

Membership is open to individuals as well as corporates. A joining fee of S$20.00 in addition to an annual subscription of S$100.00 for individuals and from S$3,000.00 for corporate members will be applied.

For more information, email admin@IAFPA.asia

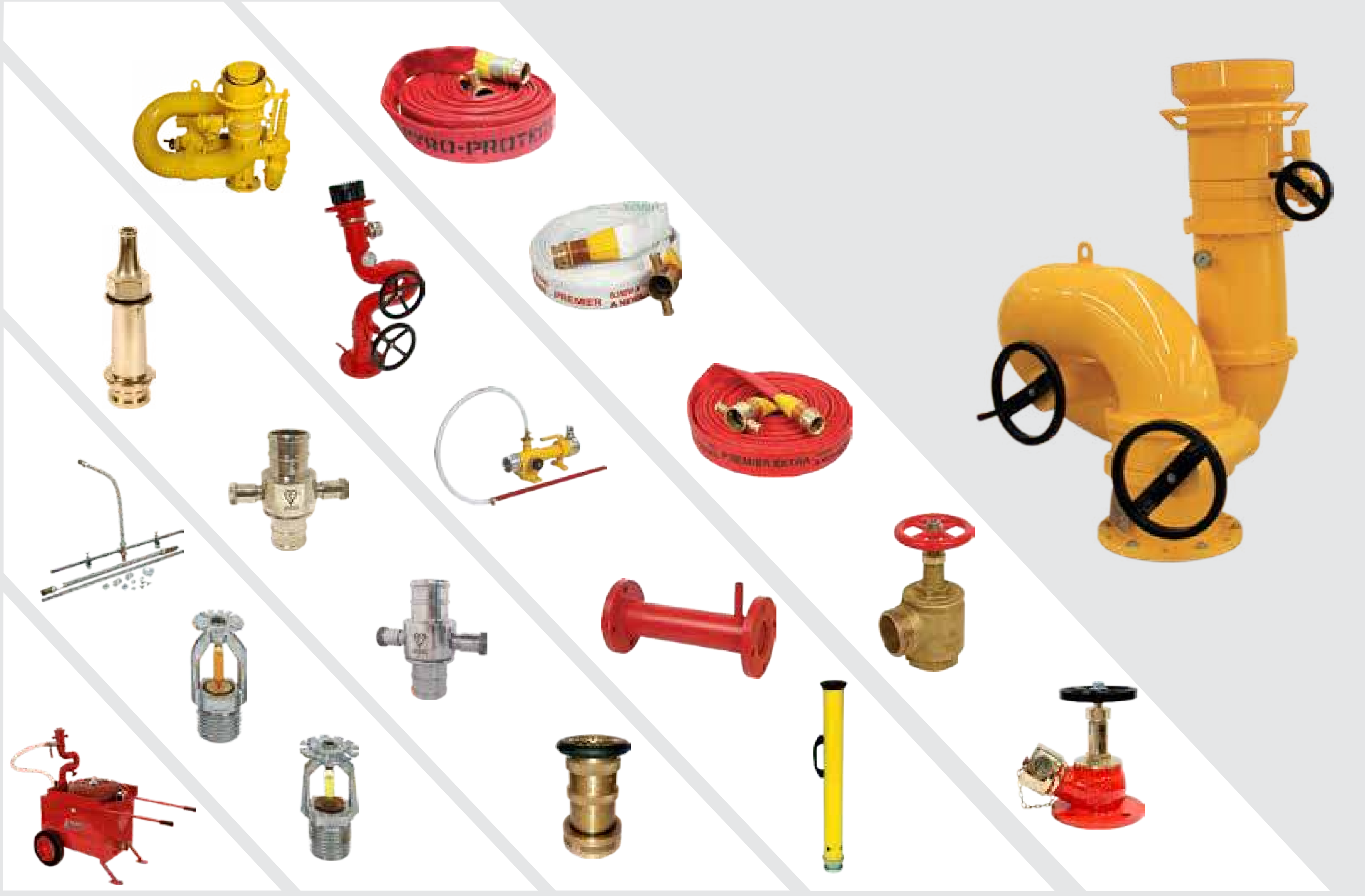
---

50 years of Reliable Protection

NEWAGE®
FIRE FIGHTING CO. LTD.

Protection With Reliability and Trust

Fight fire with complete range of NewAge - make products.



FM APPROVED

Address: "NKB House", P.O. Box No. 14, Mehta Market, Surendranagar - 363001, Gujarat, India
Phone No.: +91 2752 288 000, +91 98250 63730 | Fax: +91 11 6617 3355
Email: info@newage-india.in | Website: www.newage-india.in

New NFPA fire hood completes Bristol's comprehensive range

Bristol's range of fire hoods now includes an NFPA Standard hood which completes a comprehensive range, first introduced three years ago, and now offers firefighters protection levels which fully meet the performance standards required in most parts of the world. The original two fire hoods, designed and manufactured by Bristol, both meet European Standards.

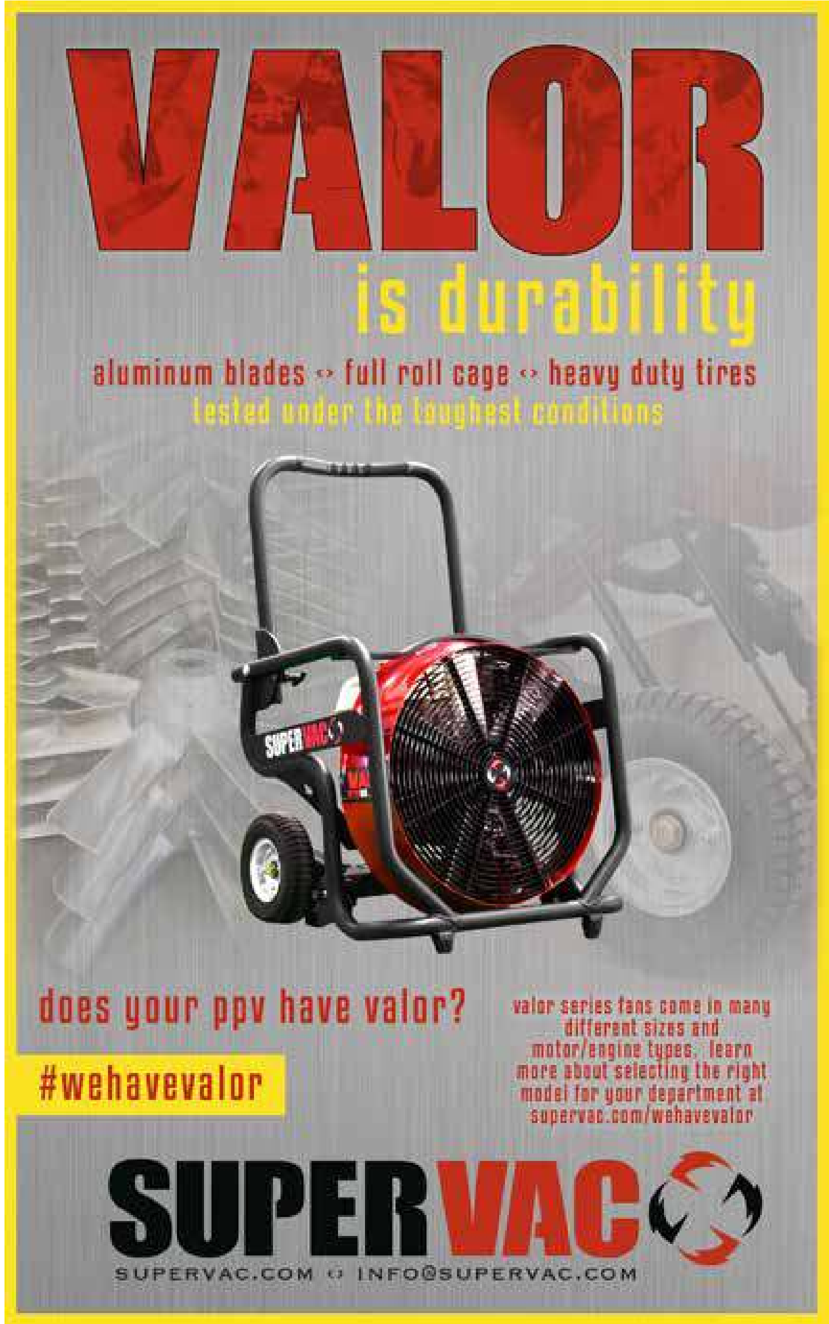
Focusing on comfort with safety, all three products are superbly comfortable, providing improved fit in garments which are both breathable and wickable. Easy to put on and take off, a major element of their design provides increased coverage to the shoulder area to reduce the risk of 'roll up' around the neck and when worn with a breathing apparatus mask. The flexibility of the fabrics used ensures full security in operational situations.

© Image courtesy of Bristol Uniforms

The original two products, designed primarily for firefighters in Europe as well as areas of the world adopting European Standards, are manufactured to BS EN13911:2004. The BristolHood1 is a two layer construction using a PBI Gold® Rib outer with an Aramid Viscose inner layer. The BristolHood2 is black and incorporates a double layer Carbonised Fibre/Para Aramid blend. The latest addition is Flash Hood NFPA – Hood7, which is a yellow balaclava style hood manufactured to NFPA 1971:2013. It uses a 40% P84/60% Lenzing fabric combination.

Commenting on Bristol's expanded range of fire hoods, Roger Startin, Bristol's joint managing director, said, "Increasingly we are looking to use the wealth of customer feedback we get from around the world to introduce new product designs. These fire hoods not only provide improved comfort and performance but enable us to offer advantages over existing products currently on the market. Our development programme has included extensive testing by firefighters in full fire gear to ensure the complete compatibility of these fire hoods with other PPE".

For more information, go to www.bristoluniforms.com


VALOR
is durability
aluminum blades ◇ full roll cage ◇ heavy duty tires
tested under the toughest conditions
SUPERVAC
does your ppv have valor?
#wehavevalor
valor series fans come in many different sizes and motor/engine types. learn more about selecting the right model for your department at supervac.com/wehavevalor
SUPERVAC
SUPERVAC.COM ◇ INFO@SUPERVAC.COM

Staying ahead with preventative maintenance

Stay ahead by improving your preventative maintenance thanks to including Portamonitor® Bearing Indicator in your management regime. This effective kit provides insight into planning of future repairs. It identifies sites which are contaminated or lacking lubrication so they can be easily fixed before any further damage occurs. Above and beyond that, the Portamonitor® identifies varying levels of damage to prevent excessive and extremely dangerous damage.

The miniature Portamonitor® has been designed to test bearings and rotating machinery on board ships and Naval vessels. Trials are being conducted with a leading Navy shortly. Portamonitor® aids in the identification of mechanically deteriorated bearings and bearings with inadequate/contaminated lubricant. It does this by detecting high frequency (ultrasonic) stress waves associated with friction and other faults with machinery in poor condition (impacts etc.). It can be used to monitor bearings in motors, pumps, fans, gearboxes and other rotating machinery applications. It has two outputs – a decibel (dB) reading and a Distress® level which are both measured and displayed simultaneously by the Portamonitor®

It is extremely sensitive to detecting faults and is easy to use: measurements can be taken both for land-based applications as well as offshore on vessels and platforms. It is quick and reliable, allowing for problem bearings to be checked quickly if damage is suspected. The repeatable results allow the operator to compare logs of past measurements which can help identify even small changes in the functioning of the bearing. The non-destructive and non-intrusive technology will not affect the function of the bearing.

For more information, go to www.coltraco.com/news

© Image courtesy of Coltraco

fireray®
The world's most trusted beam
Fireray® 3000 Exd
Flameproof Optical Beam Smoke Detector
Range 5 - 100 metres
Automatic Gain Control for drift compensation
Complies with ATEX and EN 54:12
Patented light cancellation technology cancels unwanted light
ffe
T +44 (0) 1462 444 740
E sales@ffeuk.com
W www.ffeuk.com

Bluemont Pty Ltd

Demonstrate the Hytrans HS150 system throughout Australia

In 2005, Bluemont brought to Australia the Hytrans HS150 system demonstration truck and completed live demonstrations for fire services throughout Queensland, NSW, ACT & Victoria.

This is the same unit on a similar skid platform that has been common for many years throughout the UK, Europe, Asia and the US.

For much of the world, this is not new technology as they have been using it for quite some years.

For Australia, the Fire & Rescue NSW Hytrans Bulk Water Transfer System is a first and confirms that large diameter hose and high volume mobile pumping / bulk water transfer is a capability that fire services across the world including Australia require.

The Hytrans system, which consists of a diesel powerpack driving a hydraulic submersible pump capable of accessing water in any direction up to 60 metres, was delivered in July 2015, with some work on the F&R NSW truck being completed by Hyva Pacific Pty Ltd, the commissioning and training began in early August.

The complete unit also includes an inbuilt hose box that houses 1,500 metres of 152mm / 6" large diameter layflat hose.

The best way to achieve competency is simply a matter of being hands on with the system during deployment and recovery over the training week.

Once the system was introduced, the real learning began with the hospitality of Airservices Australia at Sydney Airport.

The day involved a full deployment of the system including hose laying at 40 km/hr of the 1,600 metres of 152mm / 6" large diameter hose.

Once deployed and fully operational and user training undertaken, recovery was the next task.

The Hytrans HRU200 (hose recovery unit) is a mechanised hydraulic hose recovery system engineered for use with layflat hoses up to 200mm. The HRU200 has been proven globally, however in more recent times and locally has been well used and proven by the CFA Scoresby Hose Layer capability during the Hazelwood and Somerton woodpile fires amongst many others the brigade has attended.

The teams changed over during their first major HRU role to gain hands on experience in this task. Even though the teams changed for experience, and it was their first time, they did a great job and recovered all of the 1,600 metres of hose in less than 1 hour, which is fantastic for a first time.

The deployment locations than were changed to broaden the experience of deploying the Hytrans system and gain an insight into the flexibility of the F&R NSW bulk water capability.

The next deployment was along the Georges River at Revesby, where the Revesby aerial appliance 047 was supplied with bulk water. This deployment proved that the Hytrans capability could supply two of these units with bulk water.

The last day was out at Eastern Creek at the Sydney Motorsport park where with a team of three (3), Andrew from F&R NSW, Jasper from Hytrans and myself, we recovered 1,500 metres of hose in less than 45 minutes.

In December, with the support of F&R NSW, their Hytrans Bulk Water Transfer System was used for a demonstration of the capability for the ACT emergency services, namely the ACT F&R, ACT RFS and the ACT SES.

The attendance on the day was very positive, with approximately 30 service members turning out on a beautiful Canberra summer's day to see the Hytrans system being deployed.

The deployment was only a short run of about 400 metres along the shore of Lake Burley Griffin and the water was supplied into an ACT F&RS appliance with roof mounted monitor.

For more information, go to www.bluemont.com.au/fire-fighting/

◀ **Hytrans HS150 supplying up to 7,000lpm to an ACT Fire & Rescue appliance.**

▼ **The Hytrans HRU (hose recovery unit) in operation on the shore of Lake Burley Griffin at Canberra recovering the Fire & Rescue NSW 152mm / 6" large diameter hose.**

Images courtesy of Bluemont

FREE Subscriptions

Gulf Fire

Gulf Fire Magazine is the only quarterly journal specific to the Middle East Fire market dedicated to both fire protection and firefighting. The editorial features are written by industry experts and comprise a unique blend focussing on the latest technology, training methods and equipment as well as highlighting sector specific issues. Regular product and company profiles, events updates and news make Gulf Fire Magazine the first choice read for fire protection and firefighting professionals.

www.gulffire.com

IFP INTERNATIONAL FIRE PROTECTION MAGAZINE

IFP Magazine is the only international journal dedicated to fire safety, prevention and protection covering every aspect of the passive and active fire protection market. The editorial features are written by industry experts focusing on the latest technology and equipment as well as highlighting sector specific issues from around the world. Regular product and company profiles, events updates and news make IFP the first choice read for fire safety professionals.

www.ifpmag.com

IFF INTERNATIONAL FIRE FIGHTER MAGAZINE

IFF Magazine is the leading global publication for municipal and industrial fire fighters and the fire and rescue industry. The editorial features are written by industry experts and comprise a unique blend focussing on the latest technology, training methods and equipment as well as highlighting sector specific issues from around the world. Regular product and company profiles, events updates and news make IFF the first choice read for fire and rescue professionals.

www.iffmag.com

Written by Fire Professionals for Fire Professionals

GelTech Solutions

New fire retardant technology makes firefighting planes more effective

Single Engine Airtankers are quickly becoming the preferred fixed wing airtanker for initial attack firefighting operations. Though it has taken several decades for this shift to occur, it is now rare to come across a wildfire prone region that does not incorporate SEAT's in their aircraft mix. The use of smaller, lighter aircraft requires a more effective, more visible and lighter weight product that can be used both, for fireline building and as a suppressant to knock down live flame. Both are roles for which the single engine aircraft were originally designed. Fire management agencies had previously lacked this dual advantage during initial and extended attack operations.

GelTech Solutions worked diligently with industry and agency stakeholders to develop products that fill the demanding need in fire management, leading FireIce to become a staple to many wildland firefighting agencies. FireIce is also a versatile tool for water scooping aircraft as it environmentally inert and safe to use around open water. The use of FireIce on aircraft like the Air Tractor-based FireBoss or Canadair CL-215's has opened doors worldwide. Providing greater flexibility for aircraft firefighting roles, FireIce allows aircraft to penetrate through dense forest canopies and adhere to vegetation, making vegetation resilient to preheating or ignition. Additionally, FireIce's portability and ease of setup minimizes the time and cost of setup for an airtanker retardant bases, as it uses one tenth of the concentrate of competitor products. With a 15 year shelf life FireIce is typically stored and ready for use before the need is present, and can be on-hand in close proximity to fire occurrences with little infrastructure, and at low comparative costs to other products.

In the United States there are 13 primary wildland fire agencies with SEAT operations and half of them have already added FireIce to their programs; if your overseas agency is looking at FireIce's HVO-F, then you are not alone. Canada and Austraila are using and evaluating FireIce in their airtankers, small and large. Agencies using large airtankers have experienced the most palpable benefits of quick response and increased effectiveness, and continue to demonstrate these benefits with each new fire.

Quickly acquiring consumable firefighting products overseas is easy and convenient. IMCD in Australia has joined with GelTech Solutions and offers all FireIce products worldwide, including its municipal firefighting and structure protection products.

Already have firefighting aircraft and need increased effectiveness? Contact IMCD Australia via 03 85443100 or segan@imcd.com.au

For more information, go to www.fireIce.com

▼ **Retardant technologies now the norm.**

Image courtesy of GelTech Solutions

DISASTER & EMERGENCY MANAGEMENT

AUSTRALIAN & NEW ZEALAND DISASTER AND EMERGENCY MANAGEMENT CONFERENCE

30 - 31 May 2016 I Jupiters Hotel, Gold Coast

anzdmc.com.au

The Conference theme 'EARTH, FIRE and RAIN' will continue to examine issues that impact preparedness, resilience, response and capability.

The program will provide all participants with an opportunity to contribute, learn and network with peers. It will examine the lessons learnt from recent national and international events and provide a comprehensive forum to examine the expertise, competencies and systems relating to our preparedness and response.

The Conference Program will include an extensive range of topics with Keynotes, Concurrent Sessions, Case Studies, Panel Discussions and Poster Presentations.

TOPICS WILL INCLUDE:

- International Response to Disasters
- The Recovery Process
- Understanding and Enhancing Resilience
- Volunteers in Emergencies
- Consequence Management - from Preparation to Business Continuity
- Crisis Leadership
- Psycho-Social Implications of Disaster Management
- Emerging Technology and Capability Needs
- Urban Search and Rescue

A.I.E.S.

bushfire&natural HAZARDSCRC

Australian & New Zealand Mental Health Association

Sustainability
Association for Sustainability in Business Inc

Falco 4x4 ARFF 5500

Delivered to the Civil Aviation Authority of Bangladesh

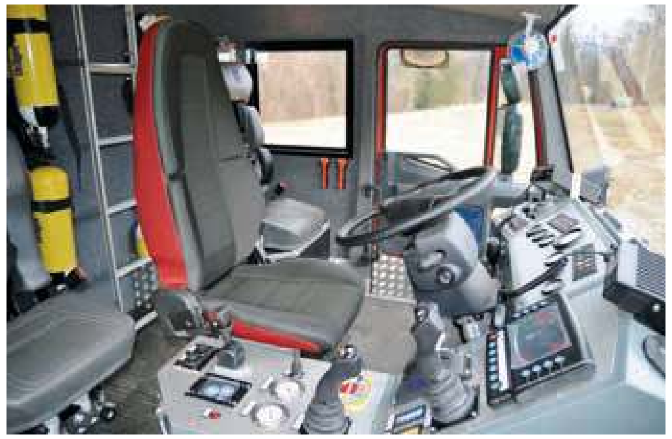
Chinetti s.r.l. were established in Varese north of the city of Milan in 1953. Since 1976 the company have been actively involved in the manufacturing of fire-fighting and specialist vehicles from their modern 4000 m2 factory and headquarters located in Bedero. Their staff are well skilled, specialized and directed by the companies experienced engineers who are equipped with the latest 3-D CAD software technology and manufacturing machinery.

The new Chinetti Falco ARFF 5500 makes use of a purpose built Thomas VP2250 4x4 airport crash tender chassis featuring a rear mounted 360 kw Euro 3 Renault DXi Turbo charged diesel engine, Twin Disc 6 speed automatic transmission plus a rapid starting kit. The functional Chinetti crew-safety cabin features a central driving position, wide opening doors, top-deck access and seating for a driver + 3 crew with SCBA mountings. It complies fully to ECR 29 crash test standards

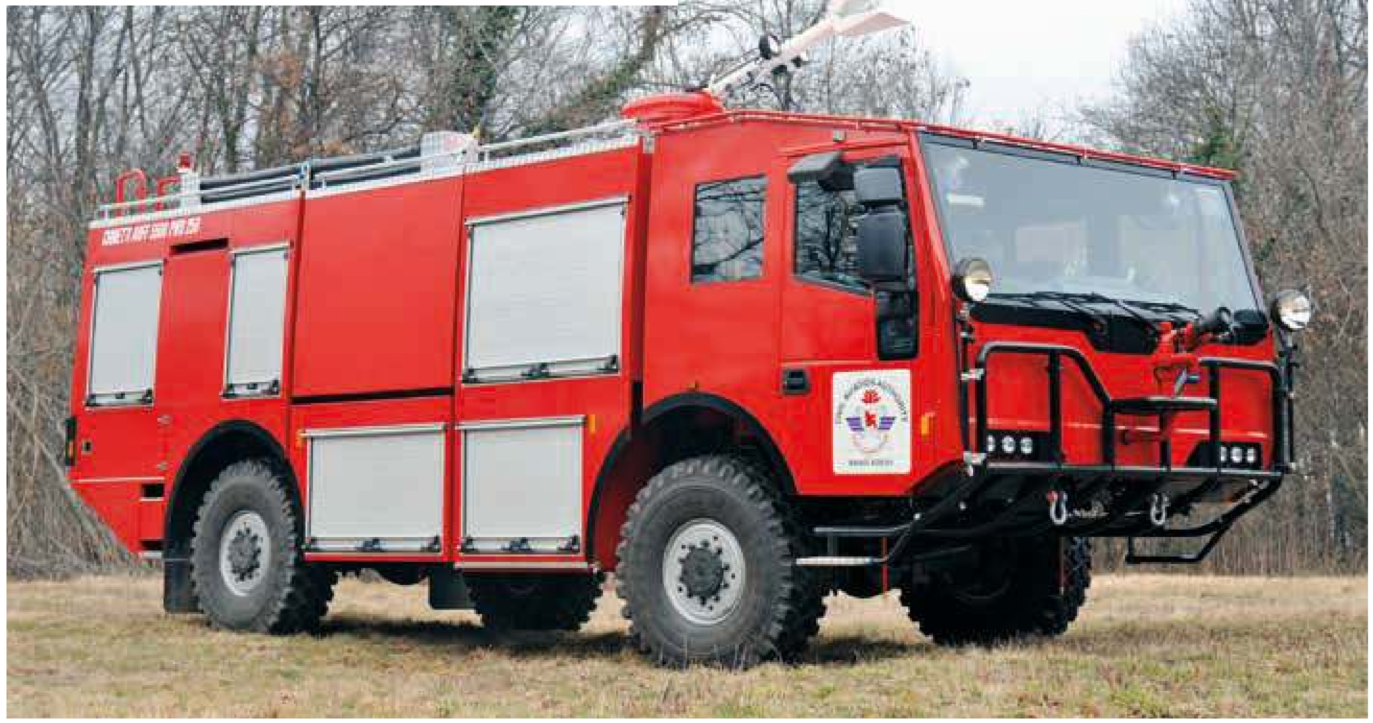
The top-deck hamper is manufactured in steel and is of modular construction. The body incorporates three functional lockers per side enclosed by roller-shutter doors, easy engine access and specific access points for periodical maintenance. The airport crash tender features polypropylene tanks carrying 5,500 litres of water and 660 litres of foam – plus 250 kg DCP. The fire engineering consists of a Godiva Prima P1A 6010 single stage centrifugal pump delivering 5,000 lpm @ 14 bar, a Fire Research Autofoam foam proportioning system, a remote dual output roof mounted monitor delivering 3,000 lpm and a light alloy bumper turret delivering 900 lpm. This Falco has been specified with 2 x 20 metre water-foam hose-reels, 2 x water-foam deliveries, 2 x dry powder side lines and a vehicle self protection system

It is destined for operation at Barisl Airport (VGBR) a domestic airport operation covering the southern city of Barisl.

For more information, go to www.chinettifire.com



◀ Interior layout of the Chinetti Fire Falco 4x4 ARFF 5500 airport crash tender.



▼ The Civil Aviation Authority of Bangladesh have received this Chinetti Fire Falco 4x4 ARFF 5500 airport crash tender.

Image courtesy of Thomas Brügger

CARROZZERIA CHINETTI s.r.l ITALY

Chinetti manufacture a full range of fire fighting vehicles, for civil defense, heavy industry and crash tender vehicles for airports. Made in Italy, the vehicles are 100% customizable according to end user specifications.

CHINETTI RIV 1500 4x4 on FORD F-550 chassis

CHINETTI AIS 70/50/PWD10 on KENWORTH C-500 6x6 chassis

CHINETTI AIS 20/60/WT20 on VOLVO FH 540 8x2 chassis

CHINETTI TEL 55, 55 mt platform on VOLVO FM440 8x4 chassis

CHINETTI AIS 4000/1000/PWD1500 on MERCEDES-BENZ 2032 4x2 chassis

Carrozzeria Chinetti S.r.l.
Tel.: +39-0332-724505
www.chinettifire.com

Tyco Fire Protection Products

Training centre in Singapore to offer training services to the fire industry

Tyco Fire Protection Products has opened a new 450 square metre training centre in Singapore to offer training services to the fire and mechanical industry. Branded as the TechXchange Academy, the centre will provide certified training courses to customers in the Southeast Asia region. It will also serve as a Centre of Excellence for specific product training in the APAC region.

This is part of Tyco's value proposition to complement its product offerings with technical service and product training. Training will be delivered by a team of local and international technical experts who are well-versed in the local and international codes and standards.

The TechXchange Academy is located at Tyco Fire Protection Products' Serangoon North office. It is equipped with a Sprinkler and Suppression hands-on training room which includes a 12 square metre spray demonstration room, a Detection hands-on training room and a conference room for theoretical training. A Foam Test Lab is in the pipeline.

The wide range of training solutions include automatic sprinkler systems, watermist systems, gaseous suppression systems, foam fire protection, detection and alarm, mechanical and grooved piping solutions. Most importantly, the training curriculum includes courses on how to design, install and maintain fire protection systems. The courses are tailored for fire installers, contractors, specifiers and engineers who design and install fire protection solutions.

"Regional facilities allow our customers to access a full range of training services. Professional training tailored to local needs and regulations is key to providing best practice in fire safety," explains Kevin White, Vice-President of Sales, Tyco Fire Protection Products – Asia Pacific & Middle East. He goes on to say, "With these well-equipped new facilities, regional teams will be able to easily hold customised sessions."

At the official opening, Tyco welcomed more than 40 customers and visitors to the centre. Through both practical and theory-based presentations, attendees received detailed insight into the current strategy and future of the centre. As part of Tyco's commitment to share knowledge and expertise within the fire protection industry, the company continues to investigate further opportunities for additional local training centres across the Asia Pacific region.

For more information, go to www.tycofsbp.com

tyco
TechXchange Academy Singapore
Marketing Leading Training, Delivered by World Class Experts

▼ Opening of Tyco's new TechXchange Training Academy in Singapore.

Image courtesy of Tyco Fire Protection Products

The 6th
China (Guangzhou) International Fire Safety Exhibition (CFE)
Guangzhou Pazhou Poly World Trade Center expo
June 13-15th, 2016

operator : Guangzhou Lisheng Exhibition Co.,Ltd
Address : Building A, Huazi Industrial Park, Chao Tian Industrial Zone, Asian Games Avenue, Panyu District, Guangzhou City, Guangdong Province, P.R.C.
Post code : 511400
Tel : +86 20 3902 1747
Twitter: stevenlee
Fax : +86 20 3646 4649
Website : www.cfe.cn.com
E-mail : stevenleee@vip.163.com

Emergency Management Conference

12th-13th July • Melbourne, Australia

All Emergencies. All Communities.

EMC has been one of the major annual emergency services conferences in Australia for the last 16 years. Every year, it brings together emergency management professionals from Emergency Services Organisations, local, state and federal governments, community groups and industry. Last year's attendance exceeded 500 delegates, and a similar number is expected in 2016.

EMC is sponsored by

- Emergency Management Victoria
- Inspector-General for Emergency Management
- Bureau of Meteorology
- Department of Economic Development
- Department of Health and Human Services
- Department of Environment, Land, Water & Planning

Images courtesy of EMC

▲ Chief offices panel discussion on current issues.

EMC is well regarded for its innovative programs and speakers. Confirmed keynotes include:

- Paul Hancock, Chief Fire Officer, Cheshire Fire & Rescue, UK
- Craig Lapsley, Commissioner, Emergency Management Victoria
- Tony Pearce, Inspector-General for Emergency Management

▼ Exhibition booth of a long term sponsor.

Other features on the program include

- Impacts of international events
- Climate change impacts
- Case studies: Wye River bushfires 2016
- Case studies: Lacrosse High rise building fire 2015
- Youth radicalisation
- Post-Traumatic Stress Disorder
- Women of Influence panel
- Diversity Workshop
- Animal emergencies
- Technology sessions
- Chiefs' Panel

Trade

EMC will also feature trade displays by up to 30 suppliers.

The EMC website is via the Emergency Services Foundation www.esf.com.au (Click on 'Conferences').

EMERGENCY
MANAGEMENT
CONFERENCE
2016

FOR YOUR PROTECTION

PACIFIC F10 MKV STRUCTURAL HELMET
Certified to AS/NZS 4067:2012
PACIFIC FACE SHIELD & EYE PROTECTOR
Certified to AS/NZS 1337.1:2010
STANFIELD'S FH33 NOMEX FLASHHOOD
Certified to NFPA 1971:2013
PACIFIC F3D MKII STRUCTURAL HELMET
Certified to AS/NZS 4067:2012
ESKA SUPER MARS PLUS GLOVES
Certified to AS/NZS 2161.6:2014 Level 3
BRISTOL UNIFORMS CLOTHING (JACKETS & TROUSERS)
Certified to AS/NZS 4967:2009 Level 3
YDS POSEIDON BOOTS
Certified to AS/NZS 4821:2014

YOUR ONE STOP SHOP FOR
FIRE PPE
WWW.PACFIRE.COM.AU

PAC FIRE AUSTRALIA

PHONE AU 1300 731 800
SALES@PACFIRE.COM.AU
WWW.PACFIRE.COM.AU

PACIFIC HELMETS
eflare Corporation
YDS
eska
UK Underwater Kinetics Uncompromising performance since 1971
BRISTOL PROTECTING THE WORLD'S FIREFIGHTERS

2016 Australian & New Zealand Disaster & Emergency Management and Search & Rescue Conference

The Disaster & Emergency Management and Search & Rescue community will unite in 2016 for education, networking and inspiration at the Australian & New Zealand Disaster and Emergency Management (DMC) and Australian & New Zealand Search & Rescue (SAR) Conferences at Jupiters Gold Coast, Australia 30 May – 1 June 2016.

5th Australian & New Zealand Disaster and Emergency Management

To be held on 30 – 31 May 2016, the Conference theme 'EARTH, FIRE and RAIN' will continue to examine issues that impact preparedness, resilience, response and capability.

An extensive range of topics will be covered at the event, with Keynotes, Concurrent Sessions, Case Studies, Panel Discussions and Poster Presentations examining the lessons learnt from recent national and international events. The Program will address planning, response and the introduction of innovative techniques in management of disasters, emergencies and hazards. It has been designed to challenge, inspire, demonstrate and encourage participants while facilitating discussion.

The Conference Committee are pleased to provide a comprehensive forum which will examine the expertise, competencies and systems relating to our preparedness and response.

DISASTER & EMERGENCY MANAGEMENT

Keynote Speakers include:

- Jonathan Coppel, Productivity Commissioner – Natural Disaster Funding, Productivity Commission
- Commissioner Katarina Carroll, Queensland Fire and Emergency Services
- Sarb Johal, Associate Professor in Disaster Mental Health, Joint Centre for Disaster Research Massey University, NZ
- Dr Joanna L. Batstone, Vice President and Lab Director, IBM Research Australia
- Brett Aimers, Adjunct Associate Professor, James Cook University. Director, Australian Institute of Emergency Services
- Brendan Moon, Acting Chief Executive Officer, Queensland Reconstruction Authority

With 500 delegates expected to attend, the Conference continues to grow and offer extensive resources, knowledge and network opportunities to those that work in the Disaster and Emergency Management community. Bringing together leading representatives from fire, police, ambulance, emergency, rescue, volunteer, defence and health sectors, the Conference will deliberate and discuss Disaster and Emergency Management issues confronting Australia, New Zealand and Internationally.

The Conference is a joint initiative of four 'not-for-profit' organisations: Bushfire and Natural Hazards CRC, Australian Institute of Emergency Services, Australian & New Zealand Mental Health Association Inc. and the Association for Sustainability in Business Inc.

Image courtesy of Search and Rescue Conference

Image courtesy of Search and Rescue Conference

Australia & New Zealand SEARCH & RESCUE CONFERENCE

Australian and New Zealand Search and Rescue Conference (ANZSAR)

The 2016 Australian & New Zealand Search and Rescue Conference (ANZSAR) will be held at Jupiters Hotel, Gold Coast on 1 June 2016.

This one day event will continue to provide a platform of discussion that began in 2015 for the Search and Rescue community. ANZSAR aims to tackle the issues and challenges in Search and Rescue and continues the support of professional development in new training, techniques and requirements.

The 2016 ANZSAR Program has been designed to challenge, demonstrate and encourage discussion on areas of Land, Sea and Air Search and Rescue. The program aims to cover these four overarching themes:

1 **Technology and Operations**
"How are advancements in technology changing the way SAR operations are conducted?"

2 **Training**
"How do we ensure that people are appropriately trained and have the right skills for all different aspects of SAR?"

3 **Organisation**
"How do we enhance the interconnectedness between multiple SAR agencies to coordinate the most effective SAR response?

4 **Working with Stakeholders**
Lost Person Behaviour (Mental Health) and Crisis Management and Communication Strategies

Keynote Speakers include:

- Duncan Ferner, Secretariat Manager, NZ SAR Council
- Dr Melanie Irons, PhD crisis communication and the use of social media
- Dean Lawrence, National President, Royal New Zealand Coastguard
- Dr Paul Luckin, Medical Consultant, SAR Training Australia
- Dr Jane Shakespeare Finch, Associate Professor School of Psychology and Counselling, Queensland University of Technology

ANZSAR brings together the volunteer and professional search and rescue communities of Australia and New Zealand to share new ideas, highlight best practice, and discuss recent events. This is a unique opportunity to meet and network with a diverse range of skilled practitioners across air, land and sea disciplines.

It is an exciting time to be involved in the search and rescue industry as the sector continues to grow and adapt with developments in emerging technology and the increasingly high profile of search and rescue missions worldwide.

Benefits of attending

The alignment of these two events provides the opportunity for emergency management and search and rescue practitioners to access three days of outstanding presentations by national and international experts.

Benefits of attending

- Be exposed to new and innovating ideas and ways of thinking
- Network with your peers and leaders in their fields
- Be inspired;
  - by an optimistic, action orientated group of people
  - by profound and positive speakers
- Learn key skills needed for ensuring the future
- Learn how to make a positive difference
- Listen to 15 Keynote Presentations by renowned speakers, over 70 concurrent presenters, over 20 forum presenters and 20 poster presenters
- Attend two networking events
- Trade exhibition with 30 exhibitors in attendance
- Access to all presenter Podcasts + Book of Proceedings

Early bird registrations are now available, please visit www.anzdmc.com.au or contact sar@anzdmc.com.au.

EFFECTIVE & FRIENDLY.
IT'S NOT AN OXYMORON.

FDIC INTERNATIONAL Visit us at Booth #3947

Solberg RE-HEALING™ Foam not only provides the performance you are accustomed to with current firefighting foams, and rely on, it's also safe for your firefighters and the environment. RE-HEALING Foam has superior vapor suppression and longer drain time for better burn-back resistance. The first true fluorosurfactant and fluoropolymer-free foam, there are no environmental concerns for persistence, bioaccumulation, or toxic breakdown.

Learn more about RE-HEALING Foam and 1%, 3%, 6%, 3x3% and 3x6% ATC™ concentrates available at **solbergfoam.com**

UL, ULC, FM, EN, ICAO
Product certifications vary dependent upon concentration type.

RE-HEALING™ FOAM
AUTHENTIC FLUORO-FREE

SOLBERG

THE SOLBERG COMPANY
1520 Brookfield Avenue
Green Bay, WI 54313
USA
Tel: +1 920 593 9445

SOLBERG SCANDINAVIAN AS
Radøyvegen 721 - Olsvollstranda
N-5938 Sæbøvågen
Norway
Tel: +47 56 34 97 00

SOLBERG ASIA PACIFIC PTY LTD
3 Charles Street
St. Marys NSW 2760
Australia
Tel: +61 2 9673 5300

Aspects of foam need careful consideration – Part 2

Part 1 in the January issue looked at PFOS as a legacy issue, why foam is so beneficial when dealing with large flammable liquid fires and how fluorotelomer surfactants provide critical fuel shedding capabilities necessary for reliable, effective and efficient firefighting operations. It began to explore some significant problems associated with fluorine free foam alternatives. Here we explore why that is the case and what causes these problems.

Mike Willson

Mike Willson has over 25 years experience in the fire industry across many sectors including Aviation, Refineries, Brigades, bulk fuel storage, much of it involved in flammable liquids as a technical specialist on Class B foams, their application and associated foam delivery systems.

What causes this F3 flammability and breakdown?

Without fluorochemicals these Fluorine Free Foam (F3) agents have no fuel shedding capability and poor vapour sealing, due to elevated levels of hydrocarbon surfactants or detergents in the foam, attracting the hydrocarbon fuels into the foam bubbles[1], with no mechanism to prevent it… except gentle application.

This means slower control and extinction, often resulting in bigger fires, more smoke and more potentially toxic run-off.

Fuel build up in this F3 blanket particularly when forcefully applied, can lead to sudden flashbacks and re-ignition[1], more water and foam resources needed[1-3], more damage and escalation with increased life safety risk for casualties, firefighters and other emergency responders. I would urge you to watch a 6 minute You Tube video …just Google "*flammable firefighting foam!*[2]", its quite an eye opener.

This video shows the F3 flash and burn away on a range of hydrocarbon fuels, with 50% foam collapse typically after about 5 minutes. Another compelling side by side fire video confirms these findings[3].

Direct comparison with C6 short chain Fluorotelomer surfactant based AFFFs exhibit neither flashbacks nor a burning foam blanket, and undergo no foam collapse even after 10 minutes[1-3]. With such fundamentally inherent F3 drawbacks caused by high detergency and no fuel shedding capability, how can F3 agents be an effective viable alternative to C6 AFFFs, based on the need for life saving fire performance?

▼ **Firefighters working safely with an effective fluorotelomer surfactant based foam blanket at Buncefield, UK.**

Image courtesy of JOIFF Member

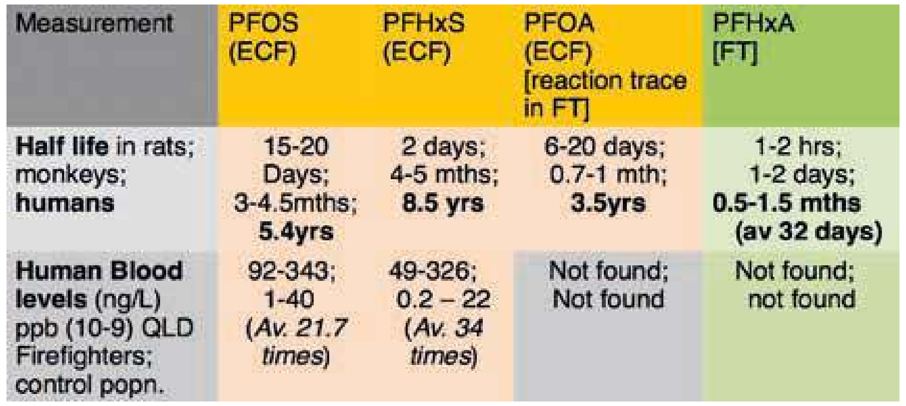
Is persistence an invented problem?

Much has been made about persistence, defined as "*the continued or prolonged existence of something* [4]", which is not necessarily harmful. It's a problem if it bioaccumulates while it persists, but if it doesn't, why should it be a problem just sitting there peacefully existing?

Some interpret it differently suggesting persistence means it is "always harmful with an increased risk of bioaccumulation and transport" which is clearly incorrect and not proven. Along with an unbalanced application of the "Precautionary Principle[5]" which can distort facts and is also sometimes used with persistence to increase fears that fluorotelomers might behave like PFOS… one day! The guiding framework of 5 key elements: anticipatory action; accurate information; alternative assessment; full cost accounting; and participatory decision making process need to be carefully followed if this Precautionary Principle[5] is to be invoked .

Concrete is man-made and persistent, but we can't get enough of it, its everywhere… and exhibits none of these concerns, so why should C^6 fluorotelomer surfactants when it is proven they are not bioaccumulative, have low toxicity and do not behave like PFOS or PFOA?

Recent studies on water fleas[6] confirm that short chain C6 chemistry is less toxic and less hazardous than long chain C8 fluorochemicals with PFOA or PFOS. It also confirms that any C6 toxicity does not increase with increasing exposure, as some have tried to imply.



Measurement	PFOS (ECF)	PFHxS (ECF)	PFOA (ECF) [reaction trace in FT]	PFHxA [FT]
Half life in rats; monkeys; **humans**	15-20 Days; 3-4.5mths; **5.4yrs**	2 days; 4-5 mths; **8.5 yrs**	6-20 days; 0.7-1 mth; **3.5yrs**	1-2 hrs; 1-2 days; **0.5-1.5 mths (av 32 days)**
Human Blood levels (ng/L) ppb (10-9) QLD Firefighters; control popn.	92-343; 1-40 (*Av. 21.7 times*)	49-326; 0.2 – 22 (*Av. 34 times*)	Not found; Not found	Not found; not found

◀ **Table 1: Summarising variation in human half-life and blood levels of differing fluorochemicals from firefighting foams [8,9].**

- Monitors
- Nozzles
- Valves

- Scene Lighting
- Governors
- Gauges

- Foam Proportioners

- Roll-up Doors

EMERGENCIES DEMAND PERFORMANCE.

Welcome to Safe Fleet Emergency & Industrial, the leading global provider of safety solutions for the fire industry. One company now offers you the most extensive selection of products for the emergency market which includes our leading brands that have been helping battle fires for 125 years. Safe Fleet delivers experience and reliability when the situation demands performance.

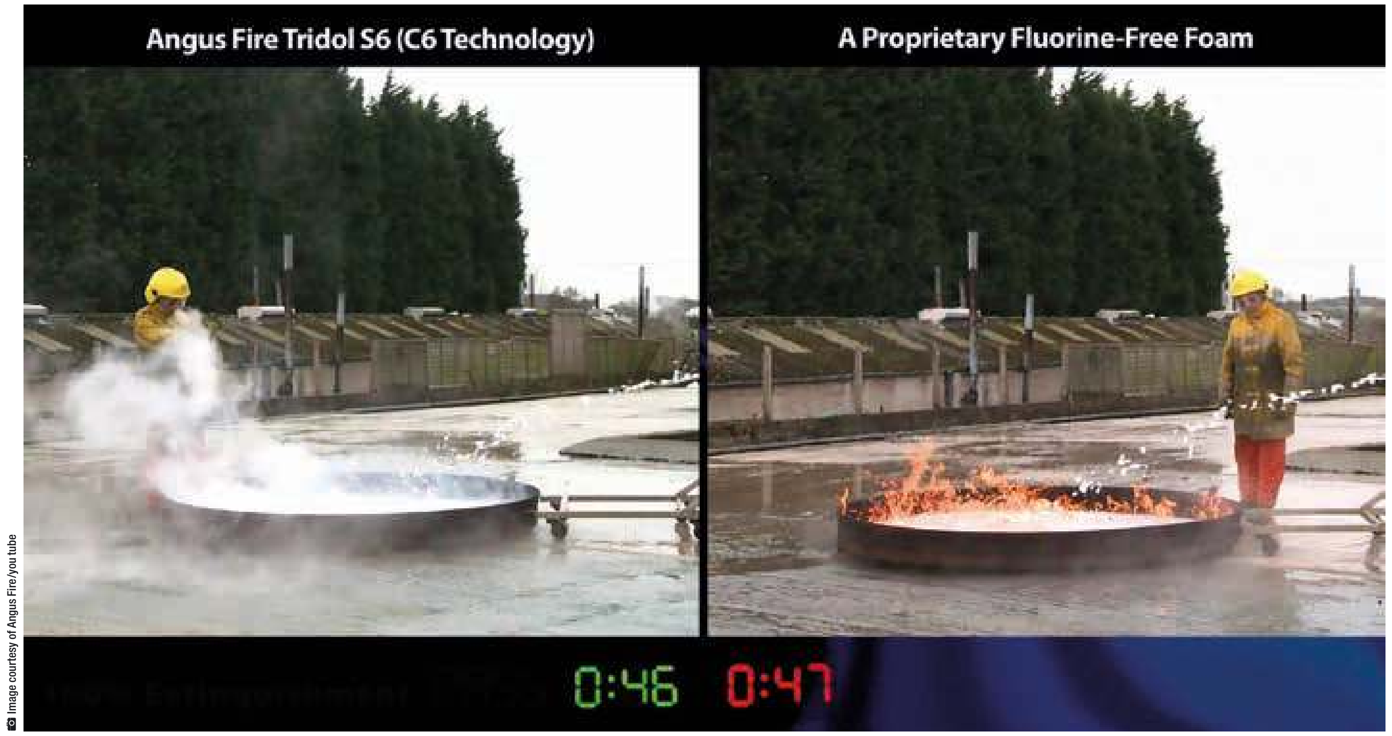
Visit us at FDIC, Indianapolis, USA, Booth #3357, to see all our new product introductions.

SAFE FLEET
Emergency & Industrial

Thomas Fahrenbach
Sales Manager, Europe & Middle East
Phone: +49 6159 7174223
tfahrenbach@safefleet.net

Tim Schanno
Sales Manager, Asia & Pacific
Phone: +1.763.280.0895
tschanno@safefleet.net

www.safefleet.net • 816.293.9040


Angus Fire Tridol S6 (C6 Technology)
A Proprietary Fluorine-Free Foam
0:46
0:47

© Image courtesy of Angus Fire/you tube

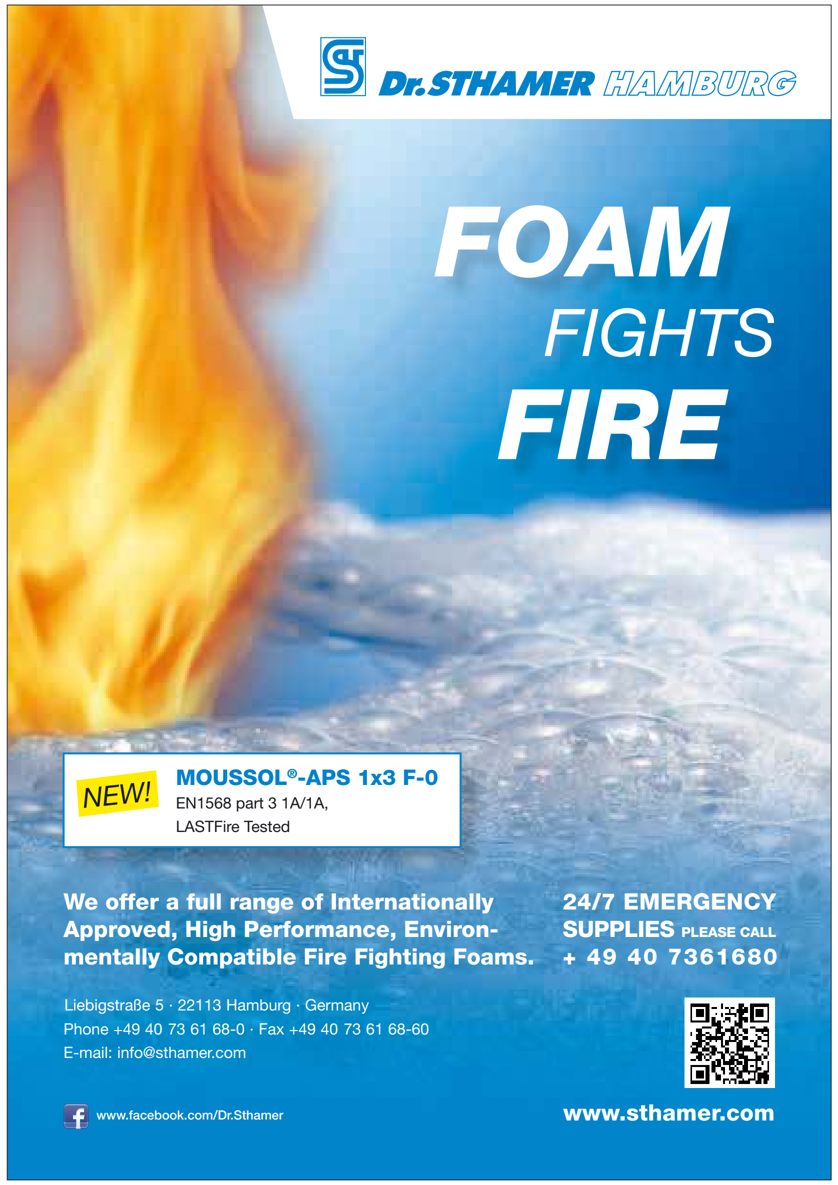
▲ **C6 Fluorotelomer surfactant based AFFF extinguished this ICAO level B test fire using Jet A1 fuel almost three times faster than the Fluorine Free Foam, which took 2minutes and 2 seconds to extinguish[3].**

High aquatic toxicity

Detergent is the most aquatically toxic of all foam's ingredients[7], so it is not surprising that F3 agents are generally 10 times more toxic to fish than AFFFs, and often more so with other smaller aquatic organisms. If F3 can require 3 times more agent for a given sized fire, this could mean 30 times greater aquatic toxicity from a specific incident and plenty of dead fish floating on the water. How is that environmentally more acceptable, particularly in land locked water bodies like streams, ponds and lakes where they may struggle to re-populate. Fish eggs are usually killed at just 5ppm detergent concentrations and only 2 ppm can cause fish to absorb double the amount of other chemicals they would normally absorb which could prove harmful, although that concentration itself is not high enough to affect fish directly from the detergent[7].

Key Fluorochemical differences

There are 3 important studies that highlight the differences between the current Fluorotelomer Process and the largely deceased Electrochemical Fluorination Process, which gave us PFOS and PFHxS



Dr.STHAMER HAMBURG

FOAM FIGHTS FIRE

NEW! MOUSSOL®-APS 1x3 F-0
EN1568 part 3 1A/1A,
LASTFire Tested

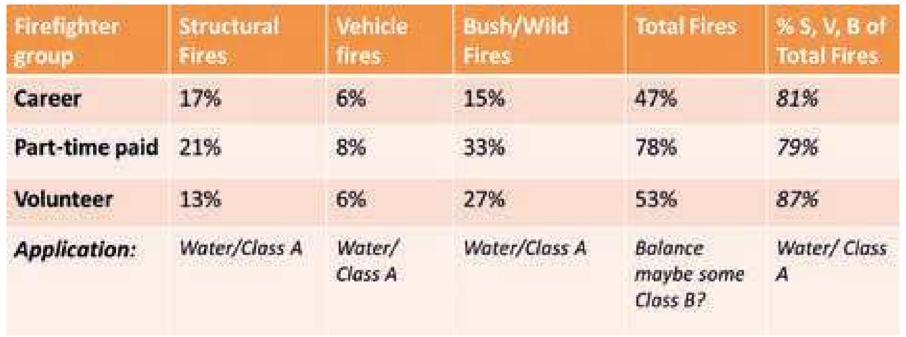
We offer a full range of Internationally Approved, High Performance, Environmentally Compatible Fire Fighting Foams.

24/7 EMERGENCY SUPPLIES PLEASE CALL
+ 49 40 7361680

Liebigstraße 5 · 22113 Hamburg · Germany
Phone +49 40 73 61 68-0 · Fax +49 40 73 61 68-60
E-mail: info@sthamer.com

www.facebook.com/Dr.Sthamer

www.sthamer.com



Firefighter group	Structural Fires	Vehicle fires	Bush/Wild Fires	Total Fires	% S, V, B of Total Fires
Career	17%	6%	15%	47%	*81%*
Part-time paid	21%	8%	33%	78%	*79%*
Volunteer	13%	6%	27%	53%	*87%*
Application:	*Water/Class A*	*Water/ Class A*	*Water/Class A*	*Balance maybe some Class B?*	*Water/ Class A*

◀ Table 2: Breakdown of incident types attended from Australian firefighter Study[10] with percent of fires requiring mostly water alone or some fluorine free Class A foam.

(or PerfluoroHexane Sulfonate), which are no longer widely used for foam applications (except in China).

A recent study shows the half-life of PFOS in humans is typically 5.4 years, while PFHxS also behaves like PFOS with around 8.5 years. PFOA is significantly less at 3.5 years, while the alternative PFHxA (PerfluoroHexanoic Acid) the main breakdown product of C6 fluorotelomer surfactants, has an average half-life in humans of just 32days[8], being fully excreted through the urinary system.

A second recent study of Queensland firefighters[9] compared to a control group of University students and office workers showed 21 to 34 times higher levels of PFOS and PFHxS in firefighters blood than the control group, which you would expect. The interesting thing is that traces of PFOA, PFHxA, the 6:2 Fluorotelomer Sulfonate or other fluorotelomer surfactant breakdown products, were not found in blood from either the firefighters or the control group. A range of novel fluorochemicals were found in firefighters blood, but they were all shown to have originated from PFOS and its related substances, which has become a legacy issue related to PFOS and the Electrochemical Fluorination Process alone.

Australian firefighter study

The third landmark study at Monash University of over 300,000 Australian firefighters[10] showed reduced mortality rates from a strong "healthy worker" effect. Yet career, paid part time and volunteer firefighters all suffered a trend of increasing prostate cancer risks, with a significant increase from vehicle fires attended.

It acknowledged a likely cause being the wide-range of inhalation and skin contact hazards occurring at fire incidents, many known or possible carcinogens like toxic gases, smoke, fumes, Polycyclic Aromatic Hydrocarbons [PAH], oxidation and pyrolysis products… and more.

Of all fire incidents encountered generally around 82% were of the structural, vehicle and bush fire types, where only water or Class A fluorine free foam would normally be used. Class B firefighting foams were not even mentioned.

Conclusions

The UK Environment Agency[11] has confirmed that all foam and firewater run-off pollutes the environment whether fluorinated or fluorine free, and the most effective agent at putting the fire out fast should be chosen. Whilst any fluorinated surfactants in foam are considered by some to be undesirable, they are necessary for such reliable, swift and effective fire performance, whilst arguably delivering less undesirable environmental outcomes in many situations than completely fluorine free foams (F3).

F3 agents cause many problems, not least increased life safety risks, slower fire control, likely more agent usage, more firewater run-off, more resulting damage and disruption, plus potentially 30 times more toxicity to the receiving aquatic environment. How can this be beneficial?

Short chain C6 fluorotelomer surfactants minimise any adverse environmental impacts by fast, effective, efficient use of minimal resources, achieved through reliable fuel shedding capabilities, without bioaccumulation potential, without human health problems and only low aquatic toxicity.

These C6 agents allow firefighters to deal with incidents quickly and safely, reducing flashbacks and escalation potential, minimising property damage and resource usage, reducing business and social disruption, potential job losses and injuries, and delivering the greatest net benefit to environmental and societal values.

Surely we should be "ring-fencing" PFOS based products as unacceptable, and choosing the alternative very different C6 fluorotelomer based foams, that are shown to be capable of securing a safer and better future for all.

For more information, email willsonconsulting26@yahoo.com.au

References

1. Jho C, 2012 – "Flammability and degradation of fuel contaminated fluorine-free foams", International Fire Fighter, Dec 2012, MDM publishing.

2. "Flammable firefighting foams! "(You Tube video), 2012 – Laboratory testing to verify fuel pickup of F3 foams www.youtube.com/watch?v=IuKRU-HudSU

3. "AFFF v fluorine free foam" (You Tube video), 2013 – Slower extinction and poorer burnbacks during comparative testing, www.youtube.com/watch?v=3MG2fogNfdQ

4. Oxford English Dictionary(on-line)- Definition of Persistence, May 2015 http://www.oxforddictionaries.com/definition/english/persistence

5. European Commission (EU), 2000 – Communication from the Commission on the Precautionary Principle, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2000:0001:FIN:EN:PDF

6. Barmentlo SH et al, 2015 – Acute and Chronic toxicity of short chain Perfluoroalkyl substances to Daphnia magna, Env. Pollution, 198, 47-53. http://www.ncbi.nlm.nih.gov/pubmed/25553346

7. Lenntech, 2015 – Summary of detergent impacts in freshwater ecosystems. http://www.lenntech.com/aquatic/detergents.htm#ixzz3UbwykSGh

8. Russell, Nilsson, Buck, 2013 – Elimination Kinetics of PerFlouroHexanoic Acid in Humans and comparison with mouse, rat and monkey, Chemosphere, Sep2013 ISSN 1879-1298 http://www.biomedsearch.com/nih/Elimination-kinetics-perfluorohexanoic-acid-in/24050716.html

9. Rotander (2015) Novel Fluorinated Surfactants Tentatively Identified in Firefighters Using LC-QTOF-MS/MS and a Case-control Approach, Environ. Sci. Technol. 49(4) 2 pp2434-2442 DOI 10.1021/es503653n http://pubs.acs.org/doi/abs/10.1021/es503653n

10. Glass et al, 2014 -Final Report Australian Firefighters' Health Study, Centre for Occupational and Environmental Health, Monash University http://www.coeh.monash.org/downloads/finalreport2014.pdf

11. Gable, 2014 – "Firefighting foams: fluorine vs non-fluorine", UK Environment Agency , Fire Times, Aug-Sep 2014.

Fatal Attraction

Air

Fluorine-free foam bubble

F3 Foam **attracts** hydrocarbon fuels

Hydrocarbon surfactant
(Hydrocarbon tails are fuel-loving)

FORCEFUL F3 APPLICATION:

- Foam attracts fuel
- Foam becomes flammable
- Foam has reduced performance
- Foam use is increased

Need proof? See F3 foams on fire:

Air

Fluorinated foam bubble

AFFF Foam **repels** hydrocarbon fuels

Fluorosurfactant
(Fluorocarbon tails are fuel-hating)

FORCEFUL AFFF APPLICATION:

- Foam repels fuel
- Foam is NOT flammable
- Foam has superior performance
- Foam use is reduced

One year ahead of the US EPA 2010 / 2015 PFOA Stewardship Program deadline, Dynax only manufactures high purity C6 Fluorosurfactants, Foam Stabilizers and optimized High Performance Blends meeting the toughest fire performance specifications (including Mil F) at traditional / reduced Fluorine Levels.

DYNAX CORPORATION
PO Box 285, Pound Ridge, NY 10576 USA
T 914 764 0202 techinfo@dynaxcorp.com
F 914 764 0553 www.dynaxcorp.com

dynax
FLUOROCHEMICALS

Quality System ISO 9001 certified
Environmental Management ISO 14001 certified
TEISEN'S
Large Volume Water Supply System

The Long Distance Large Volume Water Supply System vehicles (Hydrosub System vehicles) can supply water at up to 30,000L/ min. over long distances for fire extinguishing in the event of disasters, oil tank fires or forest fires and can also be used for emergency cooling of nuclear power plants.

The Long Distance Large Volume Water Supply System vehicle and Hose Carrier further meet the following terrorism and severe accident measures in the current nuclear regulations set by Japan's Nuclear Regulation Authority (NRA)

■Cases corresponding to prevention of nuclear disasters:

●Response to intentional aircraft crashes
●Suppression of radioactive material dispersal
●Prevention of Containment Vessel failure & large release
●Prevention of core damage (Postulate multiple failures)

Over 80 sets of these products have been supplied to nuclear power plants.

■Water Supply System vehicle

Hydrosub Model		＊HS150	HS550(F)	HS900(F)	HS1200(F)
Water volume	L/min.	3,000	14,000	20,000	30,000
Water release pressure	MPa	1.2	1.2	1.2	1.2
Water intake depth	M	60	15	15	15
Vehicle dimensions	M(L×W×H)	8.0×2.5×3.5	12.0×2.5×3.5	12.0×2.5×3.5	12.0×2.5×3.5
Vehicle weight	Kg	15,000	22,000	24,000	25,000

● (F) includes foam mixer (option)　＊HS150 is a container model.

■Hose Carrier (with detachable hose container)

Hose Recovery Unit Model		HRU200 (for 150～200MM hose diameters)	HRU300 (for 250～300MM hose diameters)
Hose load	M	1,000～1,800M	400～600M
Vehicle dimensions	M(L×W×H)	7.8×2.5×3.8	8.4×2.5×3.3
Vehicle weight (hose not included)	Kg	12,100	14,300

Teisen
TEIKOKU SEN-I CO., LTD.
7F-Yanagiya-Bild, 1-10, 2-chome, Nihonbashi, Chuo-ku, Tokyo 103-0027, Japan
TEL: (81) 3-3281-3031 FAX: (81) 3-3274-6397
E-mail: teisen-tyo@teisen.co.jp　URL: http://www.teisen.co.jp

Petroleum storage tank facilities – Part 3

In previous installments of this series we talked about the types of petroleum storage tanks, their locations, common fire hazards, described the types of fires, and fire suppression systems that storage tanks may have.

Craig H. Shelley
FIFireE, CFPS, Retired Chief

Craig is a 45-year veteran of the fire service. He served with the FDNY for 26 years retiring as the Chief of Marine Operations. Currently, Craig is an Assistant Chief with Industrial Emergency Services (IES) and Manager of Marine Operations. In addition, he is the CEO of World Safe International.

Sue Tarantino
BS, MBA, Retired Battalion Chief

Sue is a retired 27-year veteran of the Charlotte (NC) Fire Department. She is currently a Division Chief with Industrial Emergency Services (IES) and Assistant Manager of Marine Operations. She also serves as a senior fire protection specialist with World Safe International.

In this third and final article we will discuss firefighting strategies and tactics as well as pre-incident response planning basics.

Firefighting strategies and tactics

Firefighting strategies and tactics begins with a well planned and tested pre-incident response plan. This will be discussed later in the article. Storage tank fires are complex events. These fires will require the implementation of plans, preparation, proper utilization of resources, and an extensive logistics section to ensure the resources are available and arrive on scene in a coordinated and timely fashion. The following strategies and tactics for firefighting presume that the planning and preparation stages have been performed by plant and fire department personnel. Experience tells us that successful and safe extinguishment of tank fires can only be achieved when based on planning and preparation, with all associated participating in all aspects of the process as well as the exercising of the plan. Exercising the plan can be conducted with table top scenarios as well as periodic full scale exercises.

As soon as a fire department receives notification of an incident, size up and intelligence gathering should be started. Information should be gathered quickly to begin the development of firefighting strategies. The following should be considered:

- Rescue of personnel in the immediate area
- Life safety hazards to site personnel
- Extension
- Confinement
- Extinguishment
- Environmental impact
- Community impact

After the immediate issues are addressed, we need to identify the type of fire present:

- Vent fire
- Seal fire
- Piping-connection fire
- Full surface involvement fire
- Overfill fire
- Tank and dike (bund) fire
- Multiple tank fires
- Exposures

Once we have examined the above information we can then begin to develop our resource list and incident action plan (IAP). Remember that the type of product involved will impact our resource needs and tactics. The following are various types of fires and firefighting tactics:

■ Ground spill or dike fires

These fires can be viewed as simple pool or spill fires. Calculate the area (length x width) and use the correct application rate based on NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*. Knowing the product will also give you the correct type of foam concentrate and application method. Alcohol products will require a gentle application method. Firefighters should not enter the dike area unless safe to do so and approved by the Incident Commander in consultation with the incident's Safety Officer. Atmospheric testing should be conducted prior to and during entry. Exposures such as tanks, associated piping, and pumps should be protected with water via ground or fixed monitors. Ground fires should be extinguished first, then using dry-chemical equipment, valves and flanges extinguished. The most effective equipment for these combined fires would be hydro-chem™

Images courtesy of Craig H. Shelley

▲ **Foam wand being placed during training. Note the protective hose stream in place.**

technology whereby foam/water solution as well as dry-chemical can be delivered simultaneously through the same nozzle.

■ Rim seal fires

Rim seal fires can usually be extinguished using the fixed or semi-fixed foam systems if installed and properly maintained. On external floating roof tanks, if the fixed or semi-fixed fire protection systems are not present, manual firefighting will need to be performed. Under the protection of a water spray, a firefighting crew will ascend to the gauging platform with hand-held foam equipment. The primary method should be the use of foam wands to capture the fire (Photo 1 – Foam Wand) which allows the placement of specialized monitors to be placed on the lip of the tank. (Photo 2- Specialized portable monitor) The monitors can then be used to extinguish the rim seal fire using the reach of the monitor so that hoselines and personnel are not operating from the wind girder away from the ladder. If this equipment is not available, then foam hoselines could be used from the wind girder. This is a hazardous operation, and only undertaken if there is a structurally safe wind girder with handrails. (Photo 3 – Foam chamber and Wind Girder) Personnel should be secured to prevent falling.

In some instances, elevated streams from fire vehicles have been used. This is not a primary method of extinguishment. It has been noted that there is always a chance of sinking or tilting the roof under the excess water/foam solution, thus creating a larger problem, which may include an obstructed /unobstructed full surface fire.

On tanks fitted with internal floating roofs, these fires may be considered rare, but they do occur. They will be extremely difficult to extinguish unless fixed or semi-fixed fire protection systems are installed. Foam chambers and foam dams are the most effective, and the design of the system should be calculated on a full surface fire, especially if the pan below is aluminum.

The most difficult method of extinguishment in a covered floating roof tank will be to shoot foam water solution through the eyebrow vents. Using hydro-chem™ into these vents has proven effective in the past.

■ Full surface fires

Staffing requirements for a major tank fire will vary depending on the type of tank, location, water supplies, nature of the incident and the availability of trained personnel. Attacks on these fires will predominantly use the Type III “Over the Top” method of extinguishing agent delivery. The product involved will determine the required foam application rate and percentage of concentrate to water flowed. The size of the tank will also determine the application rate. For larger tank diameters a larger application rate is required. The chart below is accepted by industry experts to be the *minimum* application rates based on the tank diameter:

We help suppression system OEMs meet regulatory standards with superior electromagnetic solutions.

Call us with your challenge.

- CUSTOM AND STANDARD COMPONENTS
- ULTRA-FAST RESPONSE
- HIGH DURABILITY
- RESETTABLE
- UL RECOGNIZED COMPONENT
- CUSTOM CONFIGURATION
- ACTIVE MONITORING
- INTEGRATED SUPERVISION FUNCTION
- FULLY ENGAGED INSTALLATION DETECTION
- MEETS REQUIREMENTS OF NFPA 2001: SEC. 4.3.4.1, UL 2166, UL 2127 AND FM 5600
- 15 YEAR LIFE SPAN
- FLEXIBLE PACKAGING
- AND MORE...

COME VISIT US AT
NFPA Expo 2016
June 13-16, Las Vegas
Booth #250

CONTACT US:
+1 262-372-2165
www.tlxtech.com

TLX TECHNOLOGIES

70 BAUER KOMPRESSOREN 1946 2016

BAUER COMPRESSORS Quality. Our DNA

› Mini Verticus III Series
The most advanced compact unit system in Fire Stations and Vehicles. The system can deliever air up to 250l/min and can be upgraded to fully automatic with refrigeration dryer Air-Kool system, extrenal filling panel as well as stroage cylinders can be easily fitted.

› Containment Fill Statoins - Stationary & Mobile
BAUER offers only independently tested Containment Fill Stations which were found to protect from overpressure and fragmentation per NFPA 1901.

› BAUER Pure Air
As the market and technology leader in Breathing Air production, BAUER has instituted a Quality Seal as part of our worldwide campaign of information and quality certification in accordance with DIN EN 12021, which is in cooperation with TÜV.

BAUER PureAir - CERTIFICATE -

› BAUER COMPRESSORS ASIA PTE LTD
25 Pandan Crescent, #01-10 Tic Tech Center
Singapore 128477
Tel: +(65).6271.6271
Fax: +(65).6272.3345
Email: info@bauer-asia.com
www.bauergroup.com

TÜV SÜD

▲ Specialized portable monitor placed on lip of storage tank.

Images courtesy of Craig H. Shelley

▶ Foam chamber on tank. Note the wind girder with appropriate handrail. If the foam chamber was not present or did not function properly, the wind girder could be used to advance foam hoselines for seal fire extinguishment.

Table 1– Application rates

- Foam solution (foam concentrate + water) flow rates to be established are based on the following formula:
- Foam solution flow rate = Tank surface area x application rate (as noted in table 1 below)
- Tank surface area = 3.14 x radius2
- Application rate = as per table below

Tank Diameter	Application Rate
Up to 45.72 m (150 ft)	0.61 lpm/m2 (0.16 gpm/ft2)
45.72 m (150 ft) to 61 m (200 ft)	0.68 lpm/m2 (0.18 gpm/ft2)
61 m (200 ft) to 76.2 m (250 ft)	0.76 lpm/m2 (0.20 gpm/ft2)
76.2 m (250 ft) to 91.44 m (300 ft)	0.83 lpm/m2 (0.22 gpm/ft2)
Above 91.44 m (300 ft)	0.91 lpm/m2 (0.24 gpm/ft2) or greater

Foam concentration flow rate (lpm [gpm] of foam concentrate)

- Foam concentrate flow rate = Foam solution flow rate x foam %
- Foam % = 1%, 3%, 6% depending on type of foam, product on fire and manufacturer's recommendations

Foam concentrate quantities

- Foam concentrate flow rate (lpm or gpm) x duration
- Duration = 65 minutes for Type III (over the top) applications

Please note that these quantities are for extinguishment purposes. For vapor suppression after extinguishment it is an accepted practice to double our extinguishment supplies to maintain the suppression of vapors and prevent the possible reignition of the product.

Some of the above flows may be well in excess of 37,854 lpm (10,000 gpm) and will require large capacity delivery devices such as large trailer mounted monitors and large portable pumps.

Now that we know our flow rates and foam concentrates required we need to also look at other factors such as:

- Position and condition of roof drains
- Volume of the product
- Status of tanks and valves
- Depth of water bottoms
- Structural condition of tank
- Product in tank and its physical properties
- Is there room in the tank to accept the total foam solution without causing an overfill
- What other tanks, piping, or structures may be exposed
- Wind direction
- Weather conditions (present and expected)

In any fire situation we want to involve the local facility personnel in our planning section as technical specialists. They may also be at the command post advising the Incident Commander directly.

These fires are not our ordinary 'bread and butter' operations and should be treated as an incident that can change rapidly and unexpectedly, often with severe consequences. Do not attempt to extinguish a full surface fire without all necessary resources on the scene. Cooling of adjacent tanks would be a tactic to be used prior to all foam delivery and personnel resources are on the scene. The cooling of the tank that is on fire is not recommended unless complete 360 degree cooling can be accomplished, which is rare. Also, when cooling a tank, use only the amount of water necessary. When the cooling water stops turning to steam, you may shut down the streams and start them up again when necessary. This will conserve water supplies for extinguishment and reduce the water flowing into the dike areas. Generally between 1,893 lpm (500 gpm) and 3,785 lpm (1,000 gpm) will be required for each tank cooled. In addition to the proper delivery devices and foam supplies, we need to be sure that our foam solution delivery zone on the surface will be able to spread out once it hits the surface and cover the complete surface area. According to the National Fire Protection Association (NFPA) foam can travel effectively across at least 30m (100 ft) of burning liquid. We believe that for calculating foam runs, this number should be reduced to 24m (80 ft), ensuring that our landing zones travel and overlap each other. Firefighters should be aware of the distance a master stream can reach as well as the landing zone length and width. These can be obtained from the manufacturer of the monitors and nozzles and verified in the field during drills and exercises. By knowing this information we can pre-plan the positioning of our master streams. Range finders can be used during operations to gauge distances to the tank to assist with monitor positioning. There are a few occurrences that can happen at a storage tank fire that the fire service should be aware of. These are:

■ Slopover

This event can happen when a water stream is applied to the hot surface of burning oil, provided that the oil is viscous and the temperature exceeds the boiling point of water. It causes a short duration of slopping of froth over the rim of the tank with a minimum of intensity.

■ Frothover

Frothover is a steady, slow moving froth over the rim of a tank without a sudden and violent reaction. Frothover may occur when the tank is not on fire and water already inside the tank comes in contact with hot viscous oil which is being loaded. An example is when hot asphalt is loaded into a tank car and comes into contact with water in the tank, causing the product to froth over the top. During a fire with crude oil it may also happen when the heat wave created by the burning crude oil reaches the water layers (stratums) in the crude oil. This heat wave will convert the water to steam, causing a frothover.

■ Boilover

This event is a sudden and violent ejection of crude oil from the tank due to the reaction of the hot-layer and the accumulation of water at the bottom of the tank. The light fractions of crude oil burn off, producing a heat wave in the residue. The residues with their associated heat wave sink towards the bottom of the tank. This heat wave will eventually reach the water that normally accumulates at the bottom of the tank, and when the two meet the water is superheated and subsequently boils, expanding explosively causing a violent ejection of the tank contents and fire. The expanding contents being expelled can travel the distance equivalent of ten tank diameters. Careful consideration should be given during pre-incident response planning of the location of the command post, staging areas, rehab, equipment placement, etc.

Pre-incident response planning

When planning for a response to a petroleum storage tank facility it is best that the information gathered is done on-site and with the assistance of facility personnel. While on site, access roads that you may use to access the area and position fire apparatus (appliances) should be driven by the vehicles that will be used during an incident. Many times the turning radius of apparatus is too great to make the turns needed in the facility. Swales or culverts may also impede apparatus. If the apparatus chassis is too long and or low, it may hang up or ground while traversing a swale or culvert. Bridges on site may not allow the weight limit of new apparatus, preventing its use at an incident.

During pre-incident response planning information that should be gathered includes the following:

- Tank types, dimensions, contents and capacities
- Pipe isolation valves, locations, and operating mechanism
- Fixed fire protection systems available
- Access points to facility and tank
- Contact phone numbers
- Locations and operation of emergency shutdown devices (ESD's)
- Availability of firefighting resources
- Water supplies
- Pumping requirements
- Foam concentrate requirements
- Mutual/automatic aid available

Other information can be obtained based on the needs and requirements of your department. While these articles are not totally inclusive of all information that a fire department needs to know, it is a good start. Other resources are listed at the end of this article. It is important that firefighters attend classes on this specialized firefighting, pre-plan these facilities, and exercise the pre-plans. Don't allow these facilities to become part of the landscape. Visit these facilities and ask questions!

For more information, go to www.worldsafeinternational.com

Resources

American Petroleum Institute [API]. API Recommended Practice 2021: *Management of Atmospheric Storage Tank Fires*. Washington, DC: API, 2001, Reaffirmed 2006

Hildebrand, M. S. & Noll, G. G. *Storage Tank Emergencies: Guidelines and Procedures*. Annapolis, MD: Red Hat Publishing, 1997

Institution of Chemical Engineers [IChemE]. BP Process Safety Series: *Liquid Hydrocarbon Tank Fires: Prevention and Response*. Rugby, UK: IChemE, 2005

Shelley, C. H., Cole, A. R. and Markley, T. E. *Industrial Firefighting for Municipal Firefighters*. Tulsa, OK: PennWell, 2007

References

1. Shelley, C. H., Cole, A. R. and Markley, T. E. *Industrial Firefighting for Municipal Firefighters*. Tulsa, OK: PennWell, 2007.

Multi-agency (Integrated) CBR capability

The importance of multi-agency collaboration during major events cannot be under estimated in this world of terrorism and hazardous substances emergency agencies need to train to the same standards and continually exercise their skills. It is not just the formal interaction that is important the informal knowing of individuals across agencies ensures a safer community. This is what the Victorian emergency services are doing in Australia.

Peter Lucas

Peter Lucas has been a firefighter with the Country Fire Authority since 1976 and has been awarded the Australian Fire Service Medal. In this time Peter has been specialising in multi-agency relationship building.

Victoria, Australia

Located at the south east corner of the Australian coast is the state of Victoria. Being Australia's second-smallest state, Victoria covers 227,600 square kilometres and has a population of nearly six million people. In comparison, Victoria is roughly the size of the British Isles or slightly larger than the US state of Utah.

State CBRNe arrangements

Although small in area, Victoria has the second largest population. As such, Victoria has the largest number of persons per square kilometre. To this end, Victoria has been proactive in its approach towards combatting:

- Hazardous material (HazMat) incidents and consequences and also
- Chemical, Biological, Radiological, Nuclear and pre-cursor explosive chemical (CBRNe) incidents and consequences.

In being proactive Victoria has established:

- A CBRNe sub-committee that is responsible to government for providing appropriate arrangements to reduce the impact of CBRNe incidents by leading:
  - Agencies
  - Communities and
  - Individuals.
- A formal strategic plan and also
- The authority for an agency to have total control of the incident. Primarily this authority is provided to either, or both of its combatting agencies, being the:
  - Metropolitan Fire Brigade (MFB) and
  - Country Fire Authority (CFA).

▼ Members of the Victoria Country Fire Authority with Police and Ambulance personnel at a CBRNe training session.

Image courtesy of Peter Lucas

Furthermore, Victoria is also able to draw on its:

- Police Service (Victoria Police Force – CBR Unit)
- Department of Health – (Radiological Incidents & Health consequence)
- Ambulance Service (Ambulance Victoria [AV]) and
- Federal agencies and departments.

In addition and if required, the State Emergency Service – Victoria (SESV) is also able to assist any of the above agencies through providing additional rescue equipment for use in a Hot Zone (HZ) and also trained ancillary personnel in the Cold Zone (CZ).

In appreciation of the above arrangements, a further requirement of the CBRNe Sub-committee is to ensure that all agencies will:

- Work together;
- Use resources efficiently and effectively; and
- Ensure a seamless approach to all aspects of CBRNe incident management.

Operational planning

Although the command, control and coordination of multiple agencies at a single incident may appear confusing and complex, the use of Victoria's emergency management arrangements provides clarity, efficiency and effectiveness.

To ensure the success of a multi-agency attendance at a CBRNe incident, combined annual training is undertaken by CBRNe Specialists from the aforementioned agencies. This combined annual training is appropriately funded through a separate government training budget and the training drills are designed and facilitated by the state CBRNe Training Working Group.

Although these skills enhancement and training drills address casualty management, a strong emphasis is placed on the:

- Pre and post medical monitoring of all CBRNe Specialists who enter and leave the HZ and warm zones (WZ);
- Injury management of CBRNe Specialists within the HZ and WZ whereby the operator (notionally):
  - Is unconscious
  - Is suffering a severe fracture
  - Has a safety breach of PPE
  - Is conscious and able to self-treat and manage the situation
  - Any combination of the above.
- Familiarity and refresher training with:
  - Radio communications (Single channel – multi agency system)
  - Nomenclature and abbreviations
  - Other agencies:
  - Breathing apparatus (BA)
  - Detection and monitoring equipment
  - Rescue equipment (Sked™ and Ferno™ etc)
- Decontamination of:
  - Emergency personnel
  - Mass decontamination
  - Tools and
  - Evidence.
- Opportunity for scientific advisors to convene and provide united advice to the Incident Controller and CBRNe Specialists.

Image courtesy of Peter Lucas

▲ Members of the Fire (MFB) and Police service returning from the Hot Zone, processing evidence at the 'Evidence Table'.

Continual improvement

To further assist in the continual evolution of Victoria's CBR capability, CBRNe Specialists from the aforementioned agencies are provided the opportunity to:

- Complete a state accredited CBR Incident Controllers' course
- Complete a nationally accredited CBR Operators course
- Train with CBRNe Specialists from the:
- USA
- UK and
- Canada
- Receive a research scholarship through the Emergency Services Foundation (ESF).

Exercising Victoria's CBRNe capability and capacity within the Counter Terrorism environment

During May 2012, Exercise Hades 12 was conducted in order to test National and jurisdictional interoperability, capability and capacity to execute mass fatality arrangements within a CBRN environment. The primary scenario of this exercise involved the (notional) release of a chemical agent on board an inbound flight thereby causing the (notional) death of 12 passengers and medically affecting a further 18. On arrival at Melbourne Airport the flight was received by all of the above mentioned agencies and also Airport Firefighters from Air Services Australia.

Image courtesy of Peter Lucas

▲ **Members of the Victoria Police performing rescue drills for an 'Operator Down' under the instruction of an MFB firefighter.**

Throughout the 12 hour exercise:

The passengers were:

- De-planed and scrutinised
- Decontaminated
- Triaged.
- As the lead agency, Victoria Police was able to remain within the HZ to test its:
  - Forensic (Crime Scene) processes within a contaminated environment
  - Disaster Victim Identification (DVI) processing of contaminated cadavers
  - Prioritise the evidence and intelligence that was to be extracted from the contaminated environment.
- Both the MFB and CFA were able to test their capability and capacity in relation to:
  - Providing BA support to the Victoria Police
  - Providing mass decontamination to
  - Passengers
  - Tools
  - Evidence / intelligence
- Provide scientific advice in relation to the
  - Management of the CBRNe agent.
- Ambulance Victoria (AV) was able to test its capability to
  - Assess / triage patients within a HZ
  - Treat patients within a HZ and
  - Process the patient through decontamination (WZ). As a result of Exercise Hades 12,
- Victoria had identified its capability and capacity to manage a CBRNe incident (within the aviation environment) that involved the processing of mass casualties
- A total of 11 key recommendations were provided to the national counter terrorism committee.

Multi-Agency operational deployment

Annually and under the guidance of qualified chemists, the Victoria Police CBR Unit will attend numerous illegal (methamphetamine) chemical laboratories. The purpose for the police attendance is to:

- Prevent the (illegal) manufacture of methamphetamine
- Safely decommission the laboratories
- Rehabilitate the environment back to a level of safety
- Gather evidence / intelligence
- Prosecute those offending.

Due to the dangers associated with illegal methamphetamine laboratories, the CFA and or MFB often assist the Police in providing:

- A firefighting capability
- Rescue capability and / or
- Monitoring and detection capability.

On Sunday the 10th February 2014 the roles were reversed whereby the CFA called on the assistance of the MFB, Victoria Police and AV in order to convene a multi-agency Rapid Intervention Team (RIT) within a contaminated environment. The circumstances for the deployment of an RIT involved an out of control, complex fire within an open-cut brown coal mine at Hazelwood, Victoria.

Initially ignited from a series of smaller fires, the Hazelwood fire burned for a total of 45 days. During this 45 day period at least 20 to 30 members of the CFA and MFB were continuously rotated into the mine to fight and control the fire.

Due to the constant presence of carbon monoxide (CO)*, firefighters were required to monitor levels of the toxin, and to operate in self contained breathing apparatus (SCBA) at pre-determined trigger points.

Fire fighting crews were supported by MFB and CFA hazmat technicians with advanced monitoring equipment, and RITs in the event of serious injury or illness.

Although the RIT was not deployed in an operational capacity, it did come together, practice and was ready to conduct rescue operations within the open-cut mine.

Conclusion

Due to having a strategic plan that is adhered to, coupled with an adequate training budget and annual combined training, Victoria, (Australia) has a CBRNe capability that has the capacity to perform over an extended period.

For more information, go to www.emv.vic.gov.au

GRADALL

HOW TO FURTHER IMPROVE FIREFIGHTING EFFICIENCY AND SAFETY

TWO GRADALL FA MODELS NOW AVAILABLE

Gradall industries is introducing a second Fire Apparatus system, enabling firefighters to extend their reach even further to higher roofs or through walls and windows. FA Systems enable firefighters to drown dangerous fires with water or foam, all with remote controls that can reduce the chance for injury.

FA 70: Reach over 20 meters, up to the roofs on six- or seven-story buildings.

FA 50: Reach over 15 meters, attacking fires in buildings up to five stories in height.

Both Gradall FA models use a rugged telescoping, tilting boom and a stainless steel piercing head to smash through wood, masonry or concrete. Fires can be accessed in a fraction of the time required to use conventional methods.

SEE THE GRADALL FA IN ACTION ▶

GRADALL FA FIRE APPARATUS

WWW.GRADALLFA.COM

MTNORMAN@GRADALL.COM 001-1-330-339-2211

ALAMO GROUP GRADALL INDUSTRIES, INC. Where Ingenuity Works

The Bridge of Sighs and evacuation models

Legend has it that prisoners would sigh as they crossed it, on their short journey to a life behind bars. Nowadays, the Ponte dei Sospiri, or Bridge of Sighs, is one of Venice's star tourist attractions. Built in 1600, it joins what was the Prigioni Nuove, or new prison, to interrogation rooms in the Doge's Palace across the canal. The view from the bridge was the last glimpse of the outside world that prisoners would see, prompting Lord Byron to poetically name the bridge.

Jane Embury

Wrightstyle, based in the UK, supplies specialist steel and aluminium glazing systems worldwide. Jane Embury is the company's Marketing Director.

But the Bridge of Sighs, built for the mundane purpose of transporting people from one building to another, also has one further claim to fame. It is the world's first skybridge. Once a common architectural feature joining skyscrapers in New York, they not only joined tall buildings – often owned by the same company – but provided a horizontal means of escape in the event of fire.

Nowadays, we think solely about escape in vertical terms, usually downwards to street level. But the skybridge concept has not been totally forgotten – and Manhattan still boasts a number of the historic structures.

The best current example is between the Petronas Towers in Kuala Lumpur, Malaysia. They were the tallest buildings in the world between 1998 and 2004, and remain the tallest twin towers internationally. A double-deck skybridge connects the two towers on the 41st and 42nd floors. The skybridge isn't actually joined to either tower, being designed to slide in and out of them as the towers sway several feet in strong winds.

For the Petronas Towers, the skybridge provides an innovative fire safety feature, while also being an iconic feature of the conjoined buildings. But as we build higher into the sky, with super-tall buildings set to dwarf anything constructed today, designers and fire engineers are having to look again at features like skybridges in evacuation planning. More than anything, they're having to revisit the computational models used to predict how a building can be safely evacuated in the event of a fire.

Those models test design configurations to determine whether a building's safety characteristics are adequate, from the number of evacuation routes to the width of exit doors. The trouble, of course, is that evacuation involves the movement of people – and the behaviour of flesh-and-blood humans can't so easily be predicted.

▼ The name 'Bridge of Sighs' comes from a poem by Lord Byron. Local Venetian legend says that if a couple kiss underneath the bridge at sunset they will have eternal love.

Image courtesy of Wikimedia

It's all about psychology and how we process information. We respond to information from our physical and social environments and, based on what we perceive, we then decide what to do; hearing a fire alarm is not enough to make everyone in a building immediately move to an exit.

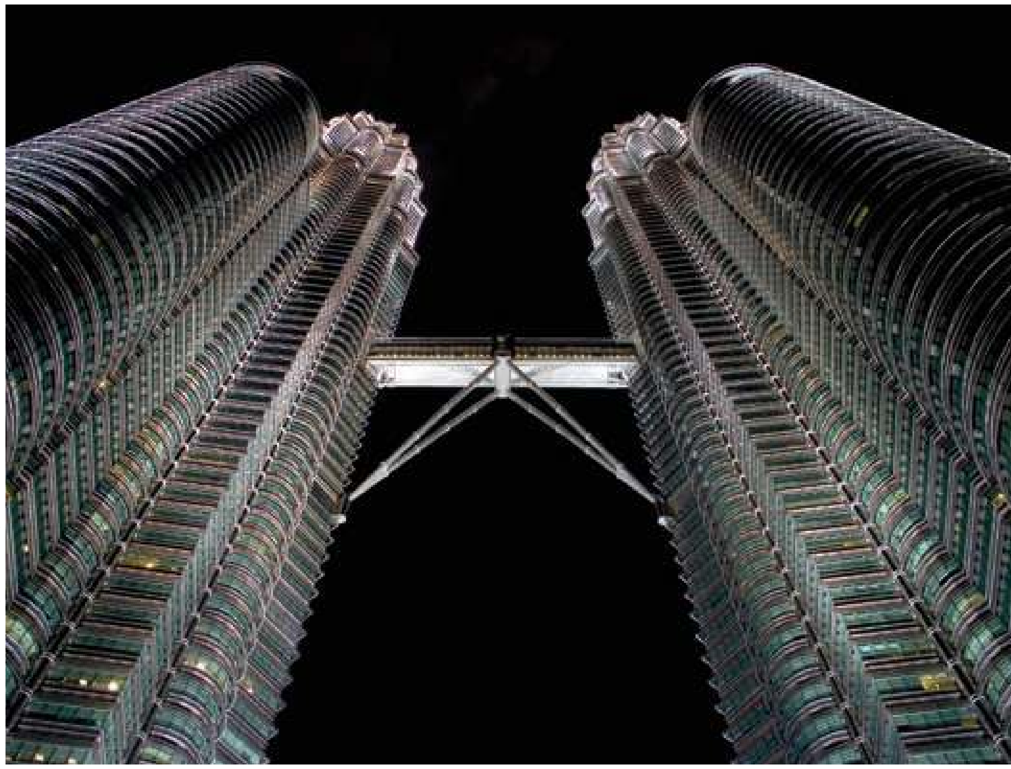


Image courtesy of Christophe Eyquem, Freemages

▲ Petronas Towers Bridge, Kuala Lumpur, links the towers at levels 41 and 42, it facilitates day to day movement and functions as an escape route in case of emergencies.

Office buildings are generally the easiest to evacuate. Staff have typically been trained in evacuation procedures, are dressed and awake, and able to make informed decisions. On the downside, many modern office buildings are open plan, making it harder to contain the fire within a small area.

Residential buildings, which include hotels, pose a different dynamic. People can be asleep, not dressed, and have only limited knowledge of escape routes. That can seriously extend evacuation times and, worse, lead to re-entry behaviour – for example, to retrieve valuables.

Most challenging are escape strategies for healthcare facilities where the occupant population will include people of limited mobility and therefore unable to perform self-rescue.

Nor is physical impediment simply about age or infirmity. As buildings are increasing in height, our physical abilities are diminishing. The buildings in which we live and work are getting taller, while we are getting fatter and more unfit. That has ramifications for evacuation procedures, and the length of time to exit a building – something that designers and fire engineers will be researching further.

Evacuation models have been used for some time to estimate the time taken to evacuate a building and are a requirement of fire safety and building approval. But research at the US National Institute of Standards and Technology (NIST), among others, demonstrates that those computer models don't necessarily reflect the variable nature of human reaction.

Indeed, computer modelling can only take us so far in designing in safety. What is also needed is an understanding of human behaviour in an emergency situation, particularly the factors that have been shown to influence our decision-making processes. By understanding those factors and processes, a fire safety team can develop a more comprehensive – and predictive – behaviour model for a building's fire evacuation.

Those predictions have to cover "exit choice behaviour" – the different exits that people will choose to leave by, often because they're also the entrances and routes by which they arrive at work. In other words, not maybe the closest exit.

Nor does it model "pre-movement times" – the period immediately following a fire alarm, when the fire has been detected but doesn't yet pose a threat. Simply, people don't always regard an alarm as an immediate call to action. Many will assume it's a false alarm or a fire drill, and do nothing.

It adds up to a building evacuation that may be greatly delayed, or patchy in nature. Recent research indicates that this "pre-movement time" is a more significant evacuation factor than the length of time taken to reach an exit. As much as two-thirds of the time it takes people to exit a building after an alarm is start-up time – time wasted in looking for more information.

All of those factors, and many other variables, can influence estimates of evacuation times, and therefore the level of protection within a building to safely allow the occupant population to escape.

Those calculations have never been more important, with a whole raft of super-tall buildings being built, mostly in the Middle East and Asia. The tallest of them all, on which work has begun, is the £780 million Kingdom Tower in Jeddah, Saudi Arabia which will stand at just over 1,000 metres and have 200 storeys. It will be three times higher than London's Shard, Europe's tallest building, and 173 metres taller than Dubai's Burj Khalifa, currently the world's tallest building – with 160 storeys.

Modern glazing systems are now an integral part of fire protection strategy, providing up to 120 minutes of protection against radiant heat, smoke or toxic gases – giving everyone, however infirm or slow, more than enough time to exit a building. Building in time is what glazing systems can do; and time-to-exit saves lives.

High-tech fire suppression systems, refuge floors, protected elevators and well-designed staircases all have a part to play in modern evacuation planning. But the role that advanced glazing systems have is also a vital element, and we're pleased that our systems can now be found in buildings great and small across the world.

Maybe, sometime, we'll also supply systems for a new generation of skybridges.

For more information, go to www.wrightstyle.co.uk

KINETIC

K-SAFE
DRAG RESCUE DEVICE

K-MOVE
SHOULDER SOLUTION

K-MOVE
ELBOW SOLUTION

K-SAFE
POCKET FLAPS

K-TREND
COLOUR DESIGN

K-TREND
ID

K-MOVE
PERFECT FIT

K-SAFE
New integrated safety and rescue components

K-MOVE
Ergonomic functional design combined with innovative materials

K-TREND
State of the art features in shape, colour and individual customer variations

K-SAFE
POCKET SYSTEM

K-SAFE
HAND PROTECTION

K-TREND
COLOUR IMAGES

K-MOVE
KNEE SOLUTION

Available in several outershells and moisture barriers.

VISIT US AT
WWW.LIONINTERNATIONAL.COM

LHD GROUP HONG KONG LTD.
Unit 1003-1004 . 10/F . Block 3
Tins' Center . No.3 Hung Cheung Road
Tuen Mun . N.T. . Hong Kong
P (+852) 2463 2982 . F (+852) 2463 2770
daniel.vonchamier@lhd-group.com

LHD GROUP AUSTRALIA P/L
Unit 3 . 15 Dunstan Road
Wingfield . South Australia
5013 Australia
P (+61) 8 8139 7777 . F (+61) 8 8139 7788
lhdaustralia@lhd-group.com

LION

"NEXT GENERATION TECHNOLOGY"

Cutters Edge®
FIRE RESCUE SAWS

- X-Torq® Engine Technology Equals More Power... More Torque ... Better Fuel Efficiency
- 75% Less Emissions

Visit us at FDIC
Indianapolis, Indiana
April 18th - 23rd Booth #1508

The new Dual-Air X-Torq® intake engine technology significantly improves overall cutting performance and meets all Air Quality Control standards at the same time.

MULTI-CUT® Fire Rescue Saw

New 2100 Series includes two engine sizes: 70.7cc and 87.9cc. Each engine is designed for use with Cutters Edge Carbide Tipped BULLET Chain® to cut the widest range of materials found at fireground and rescue scenes

CE94 Concrete Cutting Rescue Chainsaw

A new technology 94cc engine and a new style Diamond chain cuts reinforced concrete up to 16-inches thick. Features a lighter weight power head and full-wrap handle for high performance concrete cutting in any position.

MULTI-CUT® H Series Rotary Rescue Saw

New H Series is engineered and powered to work harder and operate longer in the most extreme fire and rescue conditions anywhere. The new technology engine is available in three sizes: 74cc, 94cc and 119cc. The Cutters Edge Black Star and Black Diamond Blades offer long cutting life and high speed cutting of virtually all materials.

BULLETBLADE®

What sets the BULLETBLADE® apart is that it can be sharpened and repaired. The new carbide-tipped BULLETBLADE® will cut any material any other carbide-tipped blade can cut … and more!

International Contact:
Tel: +1 541 524-9999 FAX: +1 541 524 9996
Email: info@cuttersedge.com
www.cuttersedge.com

Taiwan earthquake update

Taiwan lies on the boundary between the Eurasian Plate and the Philippine Sea Plate, which are converging at 80 mm per year. The island is the result of uplift caused by the collision of the northern end of the Luzon Arc and the continental margin of China.

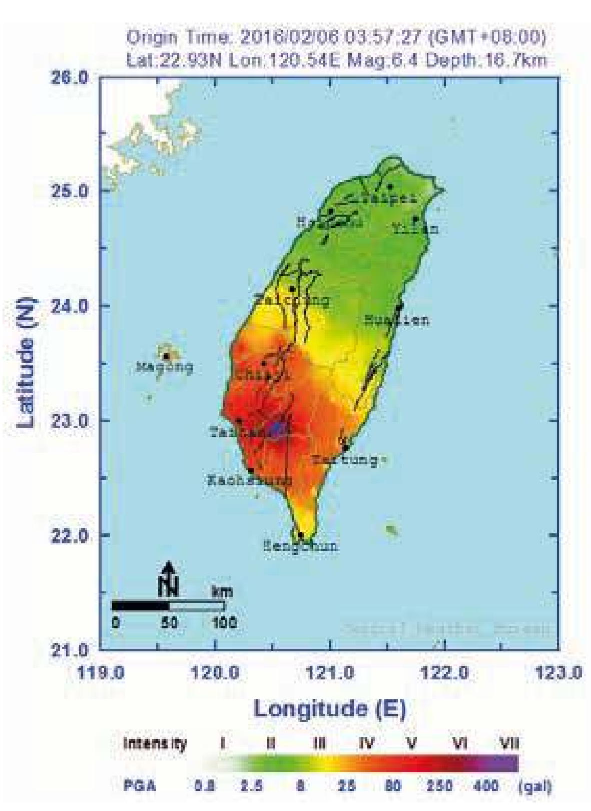
Paul Somerville

On the 6 Feb 2016 a Mw 6.4 earthquake occurred at a depth of about 20 km, about 40 km east of the southern Taiwanese city of Tainan, which has a population of 1.9 million. The seismic waves travelling northwest to Tainan from the earthquake source were amplified by the soft sediments of the Chianan Plain, which may have contributed to the damage in Tainan.

The earthquake occurred about 20 km west of the 4 March 2010 Mw 6.4 Jiashian earthquake and appears to be a delayed continuation of the stress release of that event. The worst affected city was Tainan, where numerous buildings collapsed including a 17 story residential building with about a hundred people still trapped inside. Eight buildings in Tainan collapsed or were semi collapsed, and five others were left leaning at alarming angles, evidently due to column failures on lower floors. According to the National Fire Agency, the quake left about 400,000 households without water nationwide. Power outages affected about 121,000 residences in Tainan and hundreds in Kaohsiung.

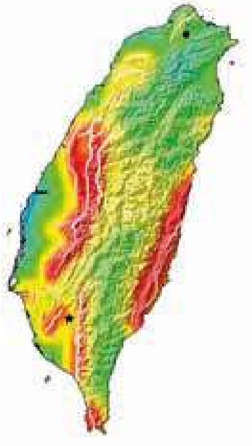
A Central Emergency Operation Center was set up shortly after the earthquake had occurred. From the operations center, President Ma Ying-jeou coordinated the rescue efforts and travelled to Tainan to view rescue efforts. The Tainan emergency services also set up emergency response centre minutes after the quake. Premier Chang San-cheng cancelled his itinerary to see for himself the devastation in Tainan. The Ministry of Health and Welfare launched six regional emergency operation centers. The National Defense Ministry confirmed that army units were dispatched for the rescue efforts consisting of 810

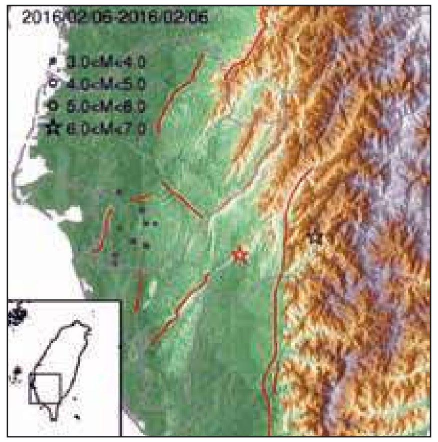
Professor Paul Somerville is Chief Geoscientist at Risk Frontiers. His main interests are in earthquake and tsunami hazards, and he has quantified these hazards and applied them in engineering practice to the seismic design and analysis of major buildings, bridges, dams and power generation facilities in Australia, New Zealand, Japan, the United States, and many other countries around the Pacific Rim. He has been involved in the development of building codes in the United States, and led developments in the engineering characterization of near-fault ground motions.



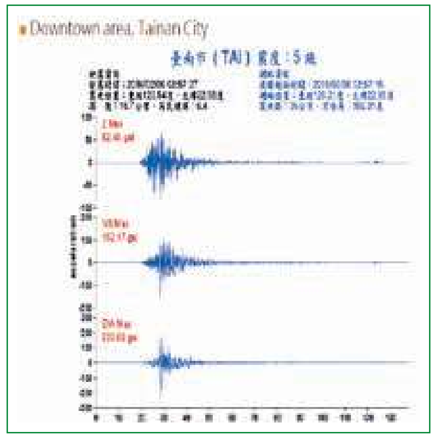
◄ Ground motion intensity map of the Tainan earthquake (Central Weather Bureau).

▼ Probabilistic ground motion map for 475 year return period, showing response spectral acceleration at 0.3 seconds period (Central Geological Survey).





▲ **Location map, with the epicentre of the 2016 and 2010 earthquakes shown by the orange and black stars respectively; orange lines show mapped active faults.**



▲ **Accelerogram of the 2016 earthquake recorded in central Tainan, with the horizontal axis showing time in seconds.**

personnel, 11 medical teams, 24 search and rescue teams and 38 vehicles. The Army Command Headquarters based in Guiren District sent two helicopters to survey the damaged areas. Kaohsiung Armed Forces General Hospital dispatched 30 medical personnel to Tainan. Armed Forces Chief of the General Staff Yen Teh-fa was stationed at the joint military operations command center to oversee the rescue efforts. A total of 1,200 beds in four locations were prepared by the military for people who lost their homes due to the earthquake. The Tainan Air Force Base was turned into a temporary shelter that could accommodate up to 1,400 people left homeless by the quake.

Rescue teams from Japan and People's Republic of China provided advice on the search and rescue efforts.

The damage caused by the quake in the worst affected city of Tainan was enormous with numerous buildings reportedly collapsed, including at least one 17-story residential building in Yongkang District, with hundreds of people trapped in the collapsed buildings. About 115 people died inside the Weiguan Jinlong building in Tainan City, including a six-month-old infant who died a few hours later in hospital. Officials reported that 397 people were rescued, with 104 of them taken to hospital. More than 500 people in total were injured from a disaster that struck during the most important family holiday in the Chinese calendar — the Lunar New Year holiday.

A total of 34 historical buildings around Taiwan were damaged, of which 23 are located in Tainan. Public Work Bureau of Kaohsiung City Government discovered 314 broken bridges in the city with 5 of them deemed unusable.

Taiwan Power Company initially reported that 121,000 households experienced power outage after the quake, and quickly restored power to most of those homes. The National Fire Agency reported that about 400,000 households were left without water supply.

Taiwan High Speed Rail (THSR) cancelled all train services between Taichung Station and Zuoying Station due to damage to the train power systems and extensive damage to its tracks north of Tainan.

Taiwan Semiconductor Manufacturing Company reported that the silicon wafers at its Tainan factory were damaged, although it did not affect much of its current shipment. United Microelectronics Corporation said that the earthquake triggered its plant safety measures to shut down the machines and that they would need recalibrating.

On 13 February 2016, Tainan Mayor William Lai declared the search and rescue mission for the earthquake victims were over. During the 7 days of search and rescue, military, fire and police rescue teams worked tirelessly with overseas assistance from China and Japan under extremely difficult conditions. Many people owe their life to these teams.

This earthquake is relevant to Australia because events of this magnitude occur somewhere in Australia about once per decade. The magnitude of the earthquake was not very large and the ground motions recorded in the surrounding region were not particularly strong. However, at about 0.25g, the peak accelerations in central Tainan were about four times stronger than typical building code values for Australia's capital cities. The building code peak acceleration of about 0.6g in Tainan is about ten times higher than in Australia.

For more information, go to www.riskfrontiers.com

▼ **The Weiguan Jinlong residential building in Tainan after collapse. The surrounding buildings do not appear to have severe damage.**

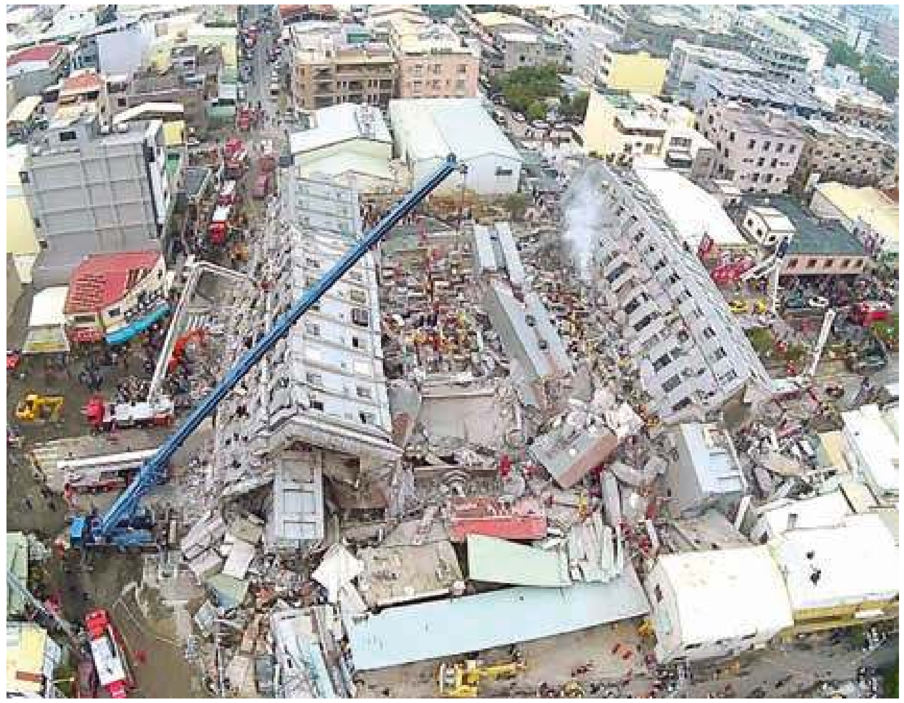


Image courtesy of Taipei Times

YONE PROEYE 751-SNR
SONAR Plus™
PAT.P

Search out by SONAR and pinpoint with the Underwater Camera Head!
Great result in dark and cloudy waters!

Sonar Image Display
U/W Camera Image Display

With the unique PROEYE 751-SNR SONAR Plus , operators can see sonar images from the SONAR System and real-life images captured by the Underwater Camera Head at the same time. The forefront technologies built into SONAR provides clear images even when searching the dark or cloudy waters of lakes and rivers.

The system is designed compactly for optional use for various types of search & rescue operations.

GPS System indicates exact location on the display.

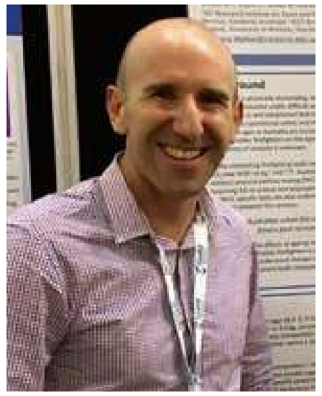
SONER Display image
54
16.4
9.0
10

Ultrasonic Tranducer of the SONAR Unit
Underwater Camera Head

YONE CORPORATION
www.yone-co.co.jp
23, Nishinakaaicho, Nishinokyo, Nakagyo-Ku, Kyoto, 604-8441 Japan
Tel: +81 75 821 1185 / Fax: +81 75 801 2263

Monitoring practices of firefighter safety when working in the heat

Firefighters work hard, in environments characterised by high levels of ambient and radiant heat. To further add to their thermal strain, urban firefighters wear heavy, impermeable protective clothing in a range of operating conditions.



Dr Anthony Walker

Dr Anthony Walker has worked as a firefighter with ACT Fire & Rescue for the past 10 years. After experiencing, and witnessing a number of heat related events at work, he chose to pursue a research program into thermal stress experienced by operational firefighters with the aim to make firefighters safer. This program culminated in him completing a PhD through the University of Canberra, awarded his doctorate in 2015. Anthony has published extensively in the field of thermal physiology and regularly presents at both local and international conferences on firefighter safety at work and bringing research from the athletic field into the work environment.

Despite structural firefighting PPC being designed for internal fire attack, it is not uncommon to see firefighters wearing this clothing to a range of events, including motor vehicle accidents, where the risk of heat illness by and large outweighs the risk of thermal injury resulting from a fire. The human body aims to dissipate body heat, mainly through a process of evaporation of sweat from the skin surface. However, modern PPC is designed specifically with the purpose of reducing chemical and steam ingress from the environment. Unfortunately, this comes with a trade-off, in that evaporation cannot occur, with sweat creating a humid micro-environment within the PPC, leading to increased body temperatures, dehydration and thermal strain for operators.

The internal heat load sustained by firefighters comes from the environment, through radiation, convection and conduction during firefighting operations.

▼ Firefighters entering the heat chamber to begin a search task.

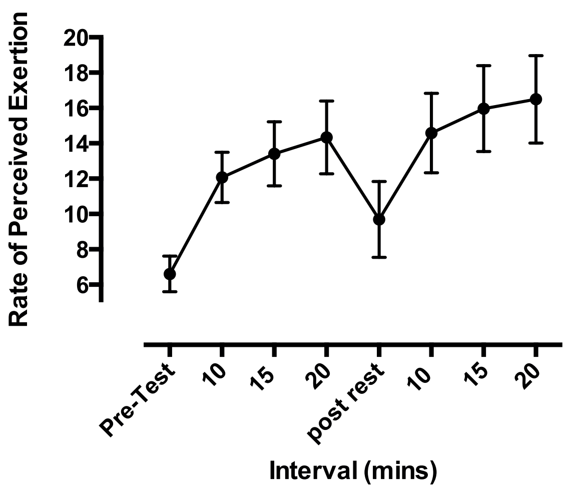
▲ Ready for a break. Firefighters exiting the heat chamber at the end of the first work cycle (20 minutes).

This heat is then augmented by the metabolic heat produced as a by-product of working (exercising). Naturally, each individual may be working at different rates, based on their fitness, their technical ability and their motivation to perform. This will then result in differing thermal loads leading to a range of body temperatures during work programs, making work/rest times problematic as a definitive tool to manage heat stress of firefighters on the fireground. To compound this problem, individuals have varying tolerances for body temperatures, making a "one size-fits all" model difficult. Guidelines for workers have been developed for working in the heat in other jurisdictions, however approaches to managing firefighters at fire scenes are not universal among different fire services in Australia.

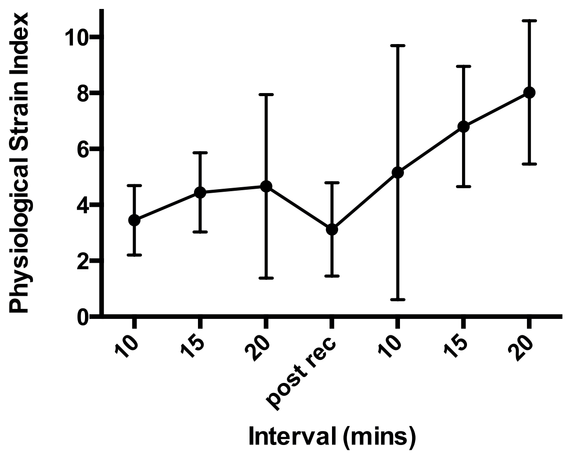
Both the International Organisation for Standardisation (ISO) and the National Fire Protection Association (NFPA) recommend that body temperatures for workers are limited to less than 38.5 ∞C during work tasks. Furthermore, allowing individuals to work at those temperatures require that they are "medically screened, heat acclimated and medically monitored (ISO 9886)." It is currently unclear whether this practice is actually followed in Australian fire services, raising questions regarding the ongoing safety of an ageing workforce delivering emergency response capabilities in the heat. Anecdotally, as a general rule, reentry is guided by the question "are you right to go mate" rather than actual physiological data. Thus, the focus of this article, will therefore be on whether, in the absence of formal monitoring, current practices for redeployment of firefighters during long-duration events can give a reasonable estimate of their safety.

In order to understand the extent of thermal strain on firefighters, ACT Fire & Rescue, led by Dr Walker, undertook a number of research projects, based out of a purpose built heat chamber operated at their training centre in Canberra. Temperatures were set at approximately 100 ∞C, with 145 volunteers from that service completing two 20-minute search and rescue tasks in smoke and darkness, separated by a 10-minute passive recovery where they removed their jackets and drank cool water. This protocol closely replicates those conditions likely to be encountered by urban firefighters during an emergency firefighting response. Firefighters were monitored for core temperatures using ingestible thermometers, heart rates and skin temperatures. These measurement tools were then compared with perceptual responses (How hard are you working – Rate of perceived exertion? How hot are you- thermal sensation?) given at 5-minute intervals during work and rest.

▼ Figure 1: Mean (SD) Perceived exertion of firefighters during two simulated work tasks in the heat.



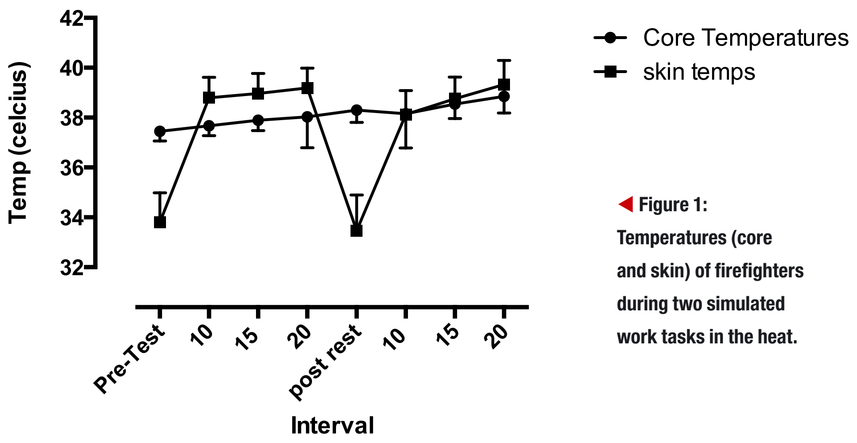
▼ Figure 2: Mean (SD) Thermal strain of firefighters during two simulated work tasks in the heat.



Some results to consider

- Core temperatures (Figure 3)
  - reached an average of 38.9 ∞C at the conclusion of the second work task. This is well in excess of safe working limits. Furthermore, 3 participants recorded temperatures in excess of 40 ∞C.
  - Continued to rise during the rest period, in spite of removing PPC
- Skin temperatures were elevated during work tasks and dropped significantly during rest. (Figure 3) This is due to removing PPC and evaporation of sweat beginning
- Heart rates of participants reached approximately 90 % of their maximum (established during lab testing, not by estimation). The work tasks were standardized, meaning that increasing heart rates were due to elevated core temperatures
- Both perceived exertion and physiological strain (Figure 1 and 2) increased during the work tasks and dropped during the rest period. This is in spite of core temperatures continuing to rise and is therefore linked with skin temperatures

When incident controllers make assessments of firefighter wellbeing based on their perception of wellness, this research indicates that this is likely an unsafe practice. Firefighter's perceptions of their wellness are linked with their skin temperatures, which in turn are affected by exposure to hot environments, wearing PPC. It is therefore intuitive to expect that, when they remove their jackets and sit in the shade they will believe that they are recovering, however this research indicates that this is not the case. In lieu of providing physiological monitoring on the fireground, which at this point in time can be expensive and impractical, a strategy could be to enforce work/rest cycles in line with NFPA 1584. This document states that firefighters should enter rehab sectors following a second work cylinder in the heat. Based on the results of this study, this seems entirely practical and appropriate for Australian firefighters working in the heat.



◀ Figure 1: Temperatures (core and skin) of firefighters during two simulated work tasks in the heat.

Overall recommendations

- Firefighters must be properly conditioned to work in the heat with high heart rates expected to occur. They must therefore be medically screened as those with existing cardiac risk factors are likely to experience elevated risk
- Fire services and incident controllers must plan for adequate resourcing to ensure that firefighters can maintain safe work/rest cycles during emergency responses.
- In line with NFPA 1584, fire services must provide evidence-based effective post-incident cooling practices. As evidenced by this research, the current practice of removing PPC and providing only water is both ineffective and unsafe. Practical solutions include iced slush drinks and cold-water immersion (multiple body segments – ie lower body at a minimum)
- Research activity in the future should focus on the development of a practical, cost effective tool for measuring core temperatures in the field. Relying on perceptions of wellbeing as a sole measure may be unsafe

For more information, email anthony.walker@canberra.edu.au

WHEN YOUR NECK'S ON THE FRONT LINE WE'VE GOT IT COVERED

We know how important the performance of PPE is, so all our garments are designed and developed by our own experts to meet your exacting specifications.

Working with the finest fabrics available, and to International Standards for structural garments, Bristol constantly innovates to protect the world's firefighters and USAR teams.

With world-class design, specification and manufacture of an extensive range of PPE, Bristol is the first choice of firefighters in over 110 countries.

To find out more about our products and support services, call us on +44 (0)117 956 3101, email us at enquiries@bristoluniforms.com or visit our web site, www.bristoluniforms.com

BRISTOL

Bristol Uniforms Limited, Wathen Street, Staple Hill,
Bristol BS16 5LL, United Kingdom
Tel: +44 (0)117 956 3101 Fax: +44 (0)117 956 5927
email: enquiries@bristoluniforms.com
www.bristoluniforms.com

ECO-DRYSHIELD
A HAINSWORTH TECHNOLOGY

ECO-DRY Shield has been developed specifically with the requirements of wildland firefighters in mind.

This necessitates that the garment be comfortable to wear during high activity levels, during which the user is exposed to extreme radiant and convective heat. A lightweight single layer construction combines the comfort of Australian Wool and Lenzing FR, with the thermal performance of DuPont™ Nomex® to allow mobility and flexibility as required during prolonged call-outs whilst at the same time providing maximum thermal protection.

Design That Saves.

HAINSWORTH®
TECHNOLOGY

+44 (0)113 257 0391
protectsyou@hainsworth.co.uk
www.protectsyou.co.uk

/protectsyou @protectsyou

Use of unmanned aerial vehicles for emergency communications

Communications during an emergency response are of paramount importance for safety of responders and efficient execution of emergency plans.

Ken Taylor

Ken Taylor has been involved in the electronics and radio-communications industries for almost forty years. He has been involved in projects with CSIRO's radio-astronomy programs and the Bureau of Meteorology's radar and satellite engineering divisions. He was responsible for the upgrading and modernisation of satellite and radio communications infrastructure for numerous Pacific Island nations and for the UK and New Zealand governments in the Pacific. Ken is currently owner of Australian UAV Technologies Pty. Ltd. (Silvertone Electronics) and is working on autopilot systems and communications and LIDAR payloads for UAV's. Ken is a member of the Institute of Engineering Technologists and the Institute of Electrical and Electronic Engineers.

However communications are highly likely to be compromised during an emergency;

- an extreme weather event, such as the Hunter Region floods on 2015 may impact communications infrastructure;
- terrain may combine with inadequate infrastructure in the area of interest to prevent direct communications with responders, such as remote area bush-fires, Search-And-Rescue operations or manhunts; and
- the event itself may generate so much traffic that existing systems cannot cope with the deluge of demand for service.

All of these situations have occurred in recent times within Australia or overseas, so this is not a theoretical exercise, but one which needs planning for.

In any of these instances extra capacity needs to be injected into the communications system to relieve congestion and alleviate black spots in coverage. Portable and mobile repeaters are the usual, and very effective, method of providing such coverage.

However there may be issues with getting resources onto the ground in the required positions within the desired time-frames. In times of extensive flooding there may be no way to get into the area at all; similarly mountainous terrain, particularly if cut off by fire, may prevent access by technical communications teams. Powering a site may be an issue of concern if fuel or batteries must be dropped in to numerous sites providing coverage to an area. Urban in-fill may be required but a situation exists whereby assets need to be physically segregated from on-ground activities, such as during civil disturbance or a mass casualty event.

In these instances, and others, an aerial platform for radio communications is a viable answer. Able to be inserted to the required area from a remote location, and to loiter in the area for hours at a time, an aircraft can provide the required infill yet be ready to move on to another location easily, without putting further responders or support teams into possible jeopardy.

There now exist Unmanned Aerial Vehicles (UAV's) with the capacity to engage in flights of twelve to twenty hours in duration, loitering under autopilot control over an area of interest. Not only can they provide surveillance capability but additional payloads such as digital radio repeaters can be placed on board a suitable aircraft. With on-board power generation to provide payload power, battery size and weight is minimised so as to maximise the available flight durations.

Not only are there UAV's now capable of operating with high-power radio payloads, but they are available with the ability to have the mission capability changed rapidly; detachable and interchangeable payload carriers mean that a swap of payload is easily performed in the field if required to support a modified mission. Daytime radio support for a remote fire scene could be changed to night-time Infra-Red surveillance when water-bombing is not operating, for example.

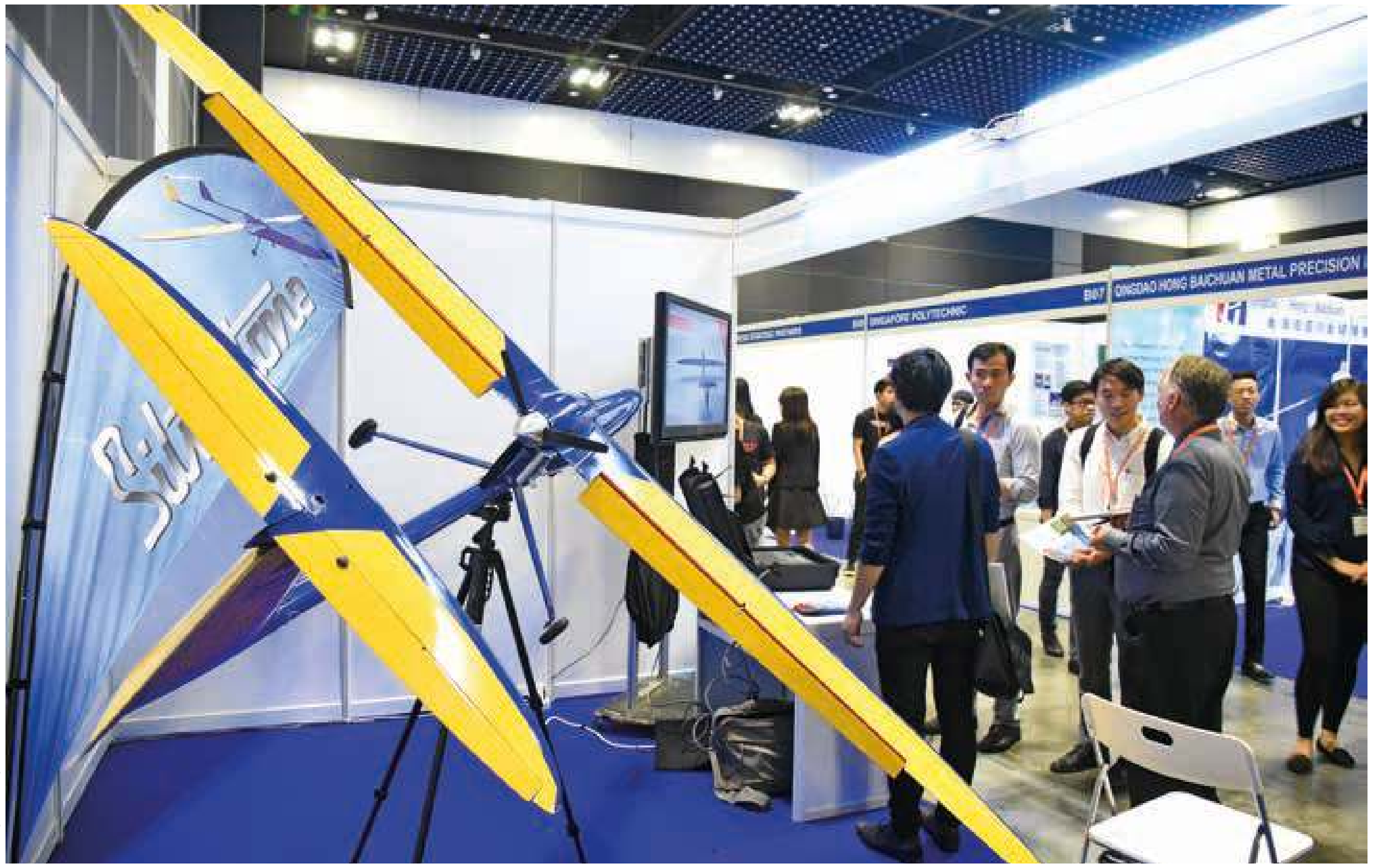
Recent trials in southern New South Wales successfully tested a VHF P25 digital repeater for almost an hour on an evaluation UAV platform. With the UAV at only 400 feet altitude, ranges for hand-held and mobile radios were extended well beyond the terrestrial line-of-sight and over terrain obstacles, exactly as expected. Working with CASA (Civil Aviation Safety Authority) it would be possible to extend the test flights into altitudes up to 1,000 feet or more, at which height a range of over 70km could be expected, now limited only by the mobile radios' capabilities.

Communications payloads providing digital services such as IP mesh capability at high bandwidths are also possible and being tested, extending capabilities beyond mere voice and into full IP streaming for video and large data volumes. Multi-payload capabilities in a UAV also would allow rapid deployment of varying payloads to meet changing requirements.

The use of UAV's opens the possibility of rapid-deployment of infill, emergency communications in a hands-off manner which will provide security of communications combined with safety of personnel. UAV's capable of easy change of payload enhance the ability to respond in a rapidly changing emergency environment.

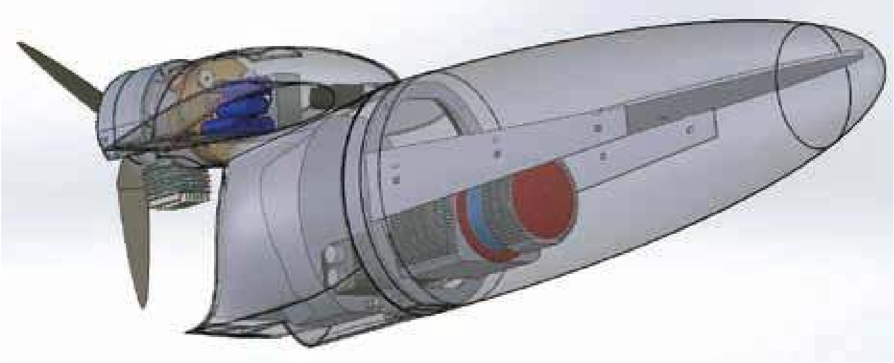
▼ UAV of the same model as the evaluation version in flight. A 4kg payload including P25 digital payload was tested over southern NSW in late 2015.

Image courtesy of Silvertone Electronics



Images courtesy of Silvertone Electronics

▶ CAD representation of high-resolution gimbal operated camera fitted to the same UAV platform's payload area. Flexibility of mission may be a key advantage of low-cost unmanned missions over more expensive manned operations.



For more information, go to www.silvertone.com.au

PERFORMANCE ADVANTAGE COMPANY

WHY PAC ?

TRADITION - SAFETY - VALUE

Total Tool Mounting Solutions!

Simple, Safe, & Secure Mounting Of Your Tools & Equipment!

Proudly Servicing The Fire & EMS Industry For A Quarter Century!

Lifetime Warranty On All PAC Products

NFPA 1901 Compliant Brackets

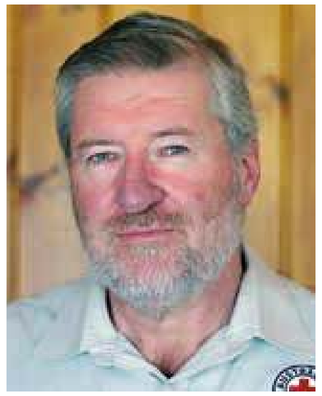
For Pricing Or More Information Please Contact Us At:

Toll-free: 888-514-0083

www.pactoolmounts.com

Smart devices are transforming door to door field operations

In Australia, post-disaster Red Cross field operations have traditionally been based on the use of hard copy maps and briefings, with paper forms used to record relief and recovery information. Whilst this is a very reliable approach, door to door visitation rates are limited by data recording timeframes, the reliable identification of properties is difficult and the high level of data transcribing is inefficient and adds accuracy risks.



Howard Colvin

Dawn Hendrick

Australian Red Cross, with support from the GIS community has found that electronic tablets offer significant efficiency and effectiveness gains for agencies coordinating door to door emergency service activities. Experience to date has indicated that compared to traditional hard copy based arrangements, this approach offers:

- Reduced human resource requirements
- Improved operator safety management
- A significantly improved operator experience, and
- Better data validation with much speedier incorporation of field data into management systems

Whilst trials to date have been in post event relief and recovery support, the technology would also appear to offer great potential for hazard response agencies, particularly in pre-event information gathering. This would appear to especially apply to agencies with casual non-career teams in the field (eg rural fire brigades and SES teams)

Background

The traditional Red Cross methodology has been to plan and coordinate door to door operations using a combination of computer based and manual hard copy systems.

▼ **Screenshot showing real time map on tablet (Fires relief outreach). Red pins indicate properties to be visited, Green indicates those already visited. Orange indicate visited but no one home**

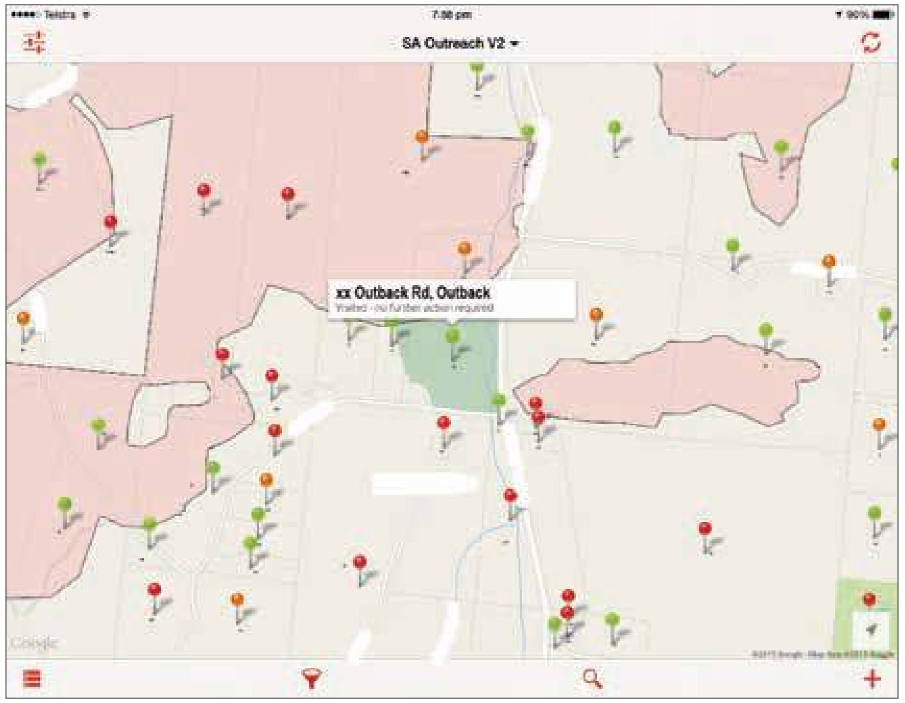
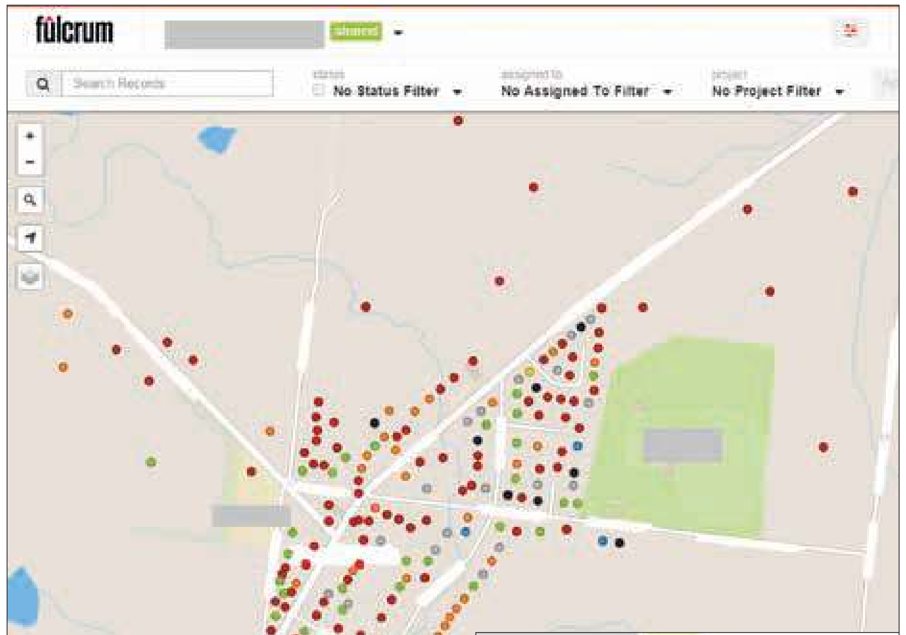


Image courtesy of Australian Red Cross

Howard Colvin is Manager Emergency Services, Tasmania, Australian Red Cross.

Dawn Hendrick is Australian Red Cross GIS volunteer team Principle, DH Geodata.



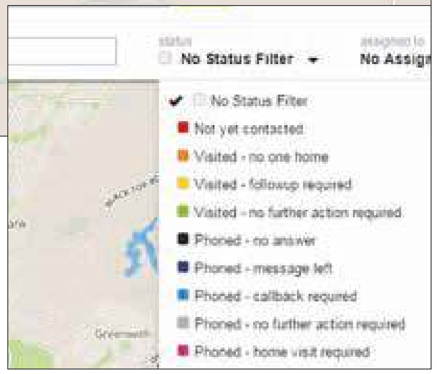

status
No Status Filter
assigned to
No Assig
✓ ☐ No Status Filter
🟥 Not yet contacted
🟧 Visited - no one home
🟨 Visited - followup required
🟩 Visited - no further action required
⬛ Phoned - no answer
🟦 Phoned - message left
🟦 Phoned - callback required
▨ Phoned - no further action required
🟪 Phoned - home visit required

Image courtesy of Australian Red Cross

▲ Corresponding map display from website portal view.

▶ Screen capture showing legend of pin colours reflecting status of record from website display screen

Where possible, the initial response planning is informed by Geospatial Information Systems (GIS) which are used to indicate the location, density and spread of impacted households. Depending on the nature of the emergency event, a combination of predictive modelling and actual impact information will be utilised. This then feeds into an options analysis which factors considerations such as the scale and urgency of humanitarian need against support delivery options and accessible resources.

The coordination of outreach operations would then be based on the use of hard copy maps and briefings, with paper forms used to transfer and record relief and recovery information in the field.

Depending on the scale of the operations, the number of personnel in the field typically varies between 2 and 100 per day. Visitation rates vary from around 5 properties per team per day for intensive support / remote locations, up to 40 properties per day for a 'knock and drop' scenario in easy terrain urban locations.

Back in the field IMT, those forms were then transcribed into a GIS linked dataset, enabling the informed planning of target locations for the next day's shift.

Inefficiency and data error potential exists at the point of transferring electronic data to and from hard copy forms at the start and end of each shift, as well as in the completion of forms by hand in the field.

As the scale of event escalates, the monitoring of personnel safety in the field became increasingly difficult. The gathering and storing of data received from the field also becomes problematic, with personnel collecting information from hundreds of households or individuals each day.

The human resource and organisational requirements in processing large amounts of data or 'Big Data'at large scale events, analysing that data and reporting meaningful information in operational timeframes ultimately becomes an overwhelming task.

While these traditional tools were sufficient for small-scale operations, for large, complex and prolonged operations the limitations could be summarised as:

- Being relatively labour intensive (especially in transcribing hard copy information to electronic datasets).
- Requiring a degree of maintained effort to ensure data accuracy (transcription error risk, difficulty in matching street addresses to actual locations, interpreting handwritten info).
- Often leading to confusion as to the correct address of individual properties that have been visited, or in confirming that a targeted visit to a specific address actually occurred at the correct property. This can readily occur where property numbers or street signs are indistinct or missing, or in internal blocks where multiple properties share the same street address.
- Requiring a substantial evening shift of the field IMT to incorporate that day's data before the following day's operations could be planned.
- Having efficiency and user experience issues constraining the breadth and timeliness of support delivery or the willingness of volunteers to re-deploy.

The move to tablets

Red Cross GIS support is provided by a network of volunteer GIS professionals, a capability which has grown from an initial agreement between Red Cross and the ACT based MAPs network.

Following the 2013 Southern Tasmanian fires, feedback from the Tasmanian GIS community identified that cost effective smart phone / tablet options could now readily enable a fully electronic approach to outreach coordination and data recording / transfer.

In particular it was identified that a local government council in Southern Tasmania was using an app (Fulcrum) for the collection of asset management data that appeared to offer a readily affordable and highly suitable option. That solution provided a web interface available at any computer (password protected), an online form creation interface and the ability to load forms to both IOS (Apple) and Android devices. It also provided the ability to see the data live via Google Earth, the capability to live feed via JSON format into QGIS enabling Operations Coordinators to monitor 'remote' operations, and an API option allowing integration with other systems (albeit requiring dedicated programming skills).

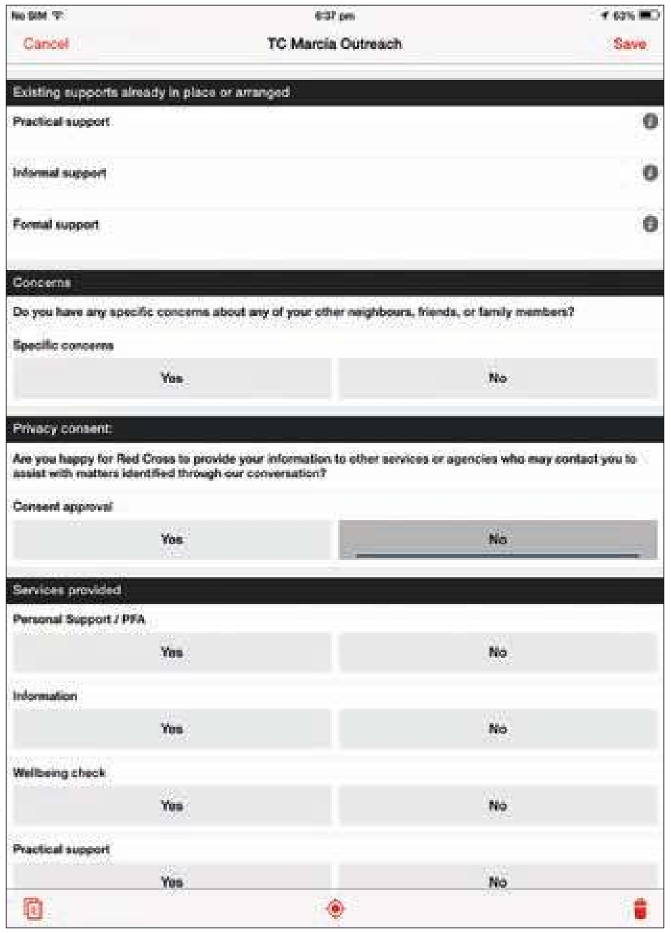
Further investigation showed that the Fulcrum app had also been successfully used by American and Ugandan Red Cross (see http://fulcrumapp.com/blog/disaster-planning-with-uganda-red-cross/) in disaster support operations.

Early in 2014, Red Cross was asked by the Tasmanian Government to lead a multi-agency outreach operation involving a number of government and community sector agencies providing door to door follow up support to specific communities recovering from the 2013 Tasmanian wildfires. This provided an ideal opportunity to test the process on a number of tablet platforms with a range of users.

That initial 2014 trial in South East Tasmania was a resounding success, with career and volunteer field staff unanimously preferring to use the tablets in preference to the traditional hard copy system.

Based on that success, Red Cross then trialled the use of tablets in post-fire relief and recovery operations in NSW and South Australia. Benefits observed in these 3 trials included:

- Simpler briefings, including the ability to visually denote individual properties for visitation.
- Consistent recording of property locations, using the tablet's GPS to auto record property coordinates.
- Human error in data collection significantly reduced through tick box and drop down list options
- Instant download to IMT databases, with negligible human resources required and a nil data transfer error component.
- Live EOC monitoring of field crew locations reducing WHS risks (where 3G coverage available).
- Teams able to monitor in real time their respective positions in the field, and see which properties had / had not been visited across all teams (where 3G coverage available)
- Next shift planning able to start at or before the completion of that day's operation (through elimination of the post-shift data transcription stage back in the field IMT)
- Field personnel reporting a significantly improved deployment experience; particularly important when dealing with volunteer workforces.



TC Marcia Outreach

Existing supports already in place or arranged

Practical support

Informal support

Formal support

Concerns

Do you have any specific concerns about any of your other neighbours, friends, or family members?

Specific concerns

Yes No

Privacy consent:

Are you happy for Red Cross to provide your information to other services or agencies who may contact you to assist with matters identified through our conversation?

Consent approval

Yes [✓ No]

Services provided

Personal Support / PFA

Yes No

Information

Yes No

Wellbeing check

Yes No

Practical support

Yes No

Image courtesy of Australian Red Cross

◀ Screenshot showing custom reporting form created for TC Marcia outreach March 2015, Rockhampton

Potential relevance to the Emergency Management Sector

Whilst initiated to support relief and recovery operations, this approach would also appear to be highly relevant for pre-event defendability mapping. For example, it would enable rural fire brigades to easily map and upload the status of individual properties in their area, with that information then accessible to Planning and Operations to guide the allocation of resources during a fire response. Volunteer brigades could also identify potential hazards such as escape choke points which could then be included in agency datasets/mapping to inform out-of-area brigades deployed to fire grounds where they would lack local knowledge.

With state and local government agencies, as well as community organisations increasingly using geospatial information systems, there is considerable scope for cross-sector partnerships and resource sharing. The same establishment costs and expertise in usage can be shared with non-emergency sector agencies involved in field data collection.

Considerations for potential adopters

- Possible resistance from some personnel to engage with modern technology (found to not be a problem where training provided prior to deployment)
- Data security and privacy risk management. (data cloud stored until downloaded)
- Establishment capital expenditure and ongoing phone card and licensing costs vs savings in personnel and site re-visiting costs
- Losing the tangible back up redundancy of hard copy forms, balanced against off-site downloads offering a different form of back up redundancy
- Requires a level of technical support to set up forms, maps and assist with any technical issues as might arise
- Does involve an electronic item that can be broken or run flat if not re-charged
- Where an emergency management or partner agency already has a resident GIS capability, the GIS platform they use is likely to also offer a smart device capability.

For more information, go to www.redcross.org.au/contact-tas.aspx

KNOW YOUR INDUSTRY
BECOME AN
FPA AUSTRALIA
MEMBER TODAY!

Fire Protection Association Australia offers a flexible range of membership options to suit all stakeholders working in or associated with the fire protection industry in Australia.

Stay connected to your industry with the latest:
- News
- Events
- Technical information
- Resources

FPA AUSTRALIA

BECOME A MEMBER TODAY Call 1300 731 922
Email member@fpaa.com.au Visit www.fpaa.com.au

THE MOST EXPERIENCED MANUFACTURER
OF SPECIAL HAZARD FIRE PROTECTION SOLUTIONS

Our team of specialists provides support
to our global distribution network.

JANUS
FIRE SYSTEMS®

Providing the Most Efficient Package For Clean Agent Delivery Systems.

CLEAN AGENT FIRE EXTINGUISHING SYSTEMS • 3M™ NOVEC™ 1230 FIRE PROTECTION FLUID
LOW & HIGH PRESSURE CO2 • FIXED DRY CHEMICAL • ALARM & DETECTION • AIR SAMPLING • FOAM

FM APPROVED UL LISTED +1 219-663-1600 www.janusfiresystems.com

---

Update on key fire standards

Standards Australia is the independent and not-for-profit developer of internationally-aligned Australian Standards. In this column, Tim Wheeler, National Sector Manager of Standards Australia, talks about updates to key standards and the next generation of Standards experts.

Tim Wheeler

Tim Wheeler, National Sector Manager for Building and Construction, Standards Australia.

Fire hazard properties of wall and ceiling linings

When it comes to matters of fire safety, debates on the suitability of building components are always front and centre. With the expertise and dedication of the FP-018 Technical Committee, we have developed a brand new standard, AS5637.1:2015 that contains all the testing requirements for determining the flammability of internal walls and ceilings. This standard will be referenced in the National Construction Code (NCC) 2016 edition which comes into force on 1 May this year.

Prior to the development of this standard, the NCC allowed two alternative and equal procedures for determining the flammability of products. For some products there appeared to be some discrepancies in results depending on the method used. To avoid any potential safety issues that may result from this, AS5637.1 lays out clear requirements of which test should be used in which circumstances. AS5637.1 will bring some clarity to industry and test laboratories and make meeting the requirements of the NCC simpler.

▼ Bryce Wood, Grant Wood and Ajay Anand understand that standards allow consumers to shop with confidence.

Image courtesy of Standards Australia

Fire detection, warning and intercom systems

2015 has been a significant year for Standards on fire detection systems. An updated version of AS1670.1 on design, installation and commissioning of fire detection and alarm systems was published. The new and improved version of the Standard introduces a number of major changes to simplify the use of the standard and helps to align Australia more closely with international best-practise. To this end, a number of ISO equipment standards that were published as Australian Standards since the last iteration of AS1670.1 have been incorporated into the document. This has significantly increased the flexibility of design and installation of fire detectionand systems, improved product compliance and simplified the requirements to meet

▲ **Back row: (left to right) Aidan Roberts, Shingai Mabambe, Ajay Anand, Irini Vazanellis, Grant Wood, Osama Ali. Front right: (left to right) Tyler Mason, Katherine Moloney, Bryce Wood. Missing: Alexandra Price**

the NCC. Other notable inclusions are a new section on smoke control systems, the establishment of baseline data retention for ongoing system maintenance and servicing, and provisions for an Alarm Delay Facility as a measure to reduce nuisance alarms in households.

Young blood at Standards Australia

Launched in 2012, Standards Australia's Young Leaders Program is designed to bring together Australia's next generation of standards experts. Up-and-coming engineers, technicians and managers are given the opportunity to become involved in national and international standards development, supporting Australian industry, government and consumers.

Ten young professionals are selected in a competitive process and trained in standards development. Paired with an experienced mentor, the Young Leaders have the opportunity to develop the skills required to be successful in the technical committee environment. The Young Leaders Program provides formal training in drafting standards, writing for a non-technical audience, and international standards development. The program also offers courses in facilitation, negotiation and leadership skills. The program also provides the opportunity to attend technical committee meetings at Standards Australia, and possibly other ISO/IEC meetings hosted in Australia.

For more information, go to www.standards.org.au

▶ **Standards help plan for innovation, as demonstrated by Alexandra Price and Osama Ali.**

Images courtesy of Standards Australia

Our Global Philosophy of growth is summed up in one word
Trust
Serving over 50 countries worldwide
WATER SPRAY NOZZLES
DELUGE VALVES
ALARM VALVES
FIRE SUPPRESSION FOAMS, EQUIPMENTS & SYSTEMS
MONITORS
UL LISTED
FM APPROVED

HD FIRE PROTECT

Manufacturing Excellence
Superior Performance
World-class Fire Fighting Products

HD FIRE PROTECT PVT. LTD.
D-6/2, Road Number 34, Wagle Estate, Thane 400604, India
Tel: +(91) 22 25182600 Fax: +(91) 22 25182602 Email: info@hdfire.com
www.hdfire.com

Exova
Testing, calibrating, advising

External Cladding – Fire Testing

Exova Warringtonfire Aus have now added to its portfolio of fire testing in Dandenong Victoria, "Fire Performance of External Cladding Systems" in accordance with BS8414 Part 1 and 2 2015, adding to our experience with ISO13785 part 1 and 2.

The National Construction Code (NCC) does not provide guidance for testing external wall materials and systems that are combustible. However recently developed standards DR AS5113, provides a framework for the classification of external wall systems and refers to test methods BS8414 Part 1 and 2 2015, ISO 13785-2 and AS1530.4-2005 Appendix B7.

Exova Warringtonfire Aus is well placed to undertake Fire Testing of External Cladding systems to the test method of your choice.

Call Exova Warringtonfire today for a quotation:

t. 03 9767 1000
e. market.pacific@exova.com
w. www.exova.com

Smartphones and sky scans for better fire mapping

Fire managers need to accurately monitor prescribed burns and bushfires to better assess how they affect fuels and how they reduce fire risk. A project at the Bushfire and Natural Hazards CRC uses satellite technology to more accurately map bushfires.

Nathan Maddock

Nathan Maddock is Communications Officer for the Bushfire and Natural Hazards Cooperative Research Centre.

In the age of smartphones, there is an app for just about everything. Why should land management be any different? Researchers in the Disaster Landscape Attribution project at the Bushfire and Natural Hazards CRC have developed an app, now in beta version, to help land managers quickly and more accurately assess fuel loads before and after prescribed burns.

"We know that when we visually assess [bushfire] fuel, estimates can differ depending on the person who assesses it," said researcher Dr Karin Reinke from RMIT University.

"We wanted something that was rapid, easy to use and more accurate."

Dr Reinke is working with a team of researchers at RMIT, co-led by Professor Simon Jones. There are two parts to the study: the first is developing the beta app to assess fuels in the landscape pre and post-fire, and the second is investigating active fire mapping and detection using satellites.

Terrestrial LiDAR, which involves lasers and light, has been used in the project to map bushfire fuels. While effective, it is an expensive process that requires experts to run the technology. Enter the beta smartphone app: Fuels 3D.

"We want to attribute fire landscapes in terms of the amount, structure and connectivity of the fuel present, and to understand the impact of fire and how fuel characteristics may change, and what remains as residual afterwards," explained Professor Jones.

"Using a computer vision technique called 'structure from motion' (SFM), a camera phone can be used, or any similar commercial-grade camera, to take a series of photos to create a point cloud."

A point cloud represents the external surface of an object. SFM allows for information about the structure to be extracted, which results in a 3D model of the fuels. The team reviewed several different technologies to assess which ones would work best.

▼ A test fire is set up for the TET-1 satellite to assess on pass-over.

Image courtesy of Karin Reinke

"We validated these technologies against dry weight samples of the fuel," explained Dr Reinke.

"After we collected the imagery, the fuel was harvested to mineral earth, oven dried and weighed to compare it back to our point cloud estimates from the different technologies evaluated.

"We found good agreement between the terrestrial LiDAR and the SFM approaches, and good agreement back to the harvested samples.

"But terrestrial laser scanning typically requires experts to implement it, and has much longer data collection and set-up times. Structure from motion data acquisition is really quick," said Dr Reinke.

The team has developed the beta version of Fuels 3D for Android platforms using SFM technology through the know-how of researcher Dr Luke Wallace.

The app is being developed in conjunction with a sampling protocol to complement existing fuel hazard assessment practices, allowing land managers to take photos of prescribed burn areas, both before and after a burn, to understand how the burn affects fuel loads.

"Fuels 3D should be easier and quicker than visual estimation," said Dr Reinke.

A workshop was held in Melbourne in early December 2015, where the research team explained Fuels 3D to land managers from Victoria's Department of Environment, Land, Water and Planning and the Country Fire Authority, and South Australia's Department of Environment, Water and Natural Resources (DEWNR).

While Fuels 3D has already been undergoing trials between the research team and end user partners, large-scale validation is needed. It is hoped the app will not only standardise estimation of fuel loads, but make a real difference to how land managers assess the efficiency of prescribed burns.

This would be a big advance, according to Simeon Telfer, an end user and fire manager at DEWNR.

"Not only would it be an advantage for our prescribed burning program, in understanding more accurately how fuel is distributed and the fire severity of our prescribed burns, but it will also help with a greater understanding of what the change in fuel means for a bushfire," outlined Mr Telfer.

"In the end we are trying to reduce risk through lowering bushfire intensity, but at the moment we are making some estimates about the percentage of fuel burnt based on visual assessments. A greater understanding of what fuel reduction means for risk reduction will be fantastic.

"DEWNR is pretty excited to be involved in this project and to have the ability to get some good measures around reduction of fuel loads and seeing how useful the outcomes are," Mr Telfer said.

Eyes in the sky

The project is also assessing the role satellites play in mapping bushfires, from their boundaries to their hotspots and flare-ups.

"We are looking at the detection of fires as the starting point," explained Dr Reinke.

"One of the focus satellites is TET-1, a German satellite launched in July 2012, which is the first in the German FireBird constellation."

Up to seven satellites are expected to complete the constellation in coming years, with the German Aerospace Agency, Deutsches Zentrum fur Luft und Raumfahrt, a formal partner in the project.

The other focus satellite is Japanese satellite Himawari-8, launched in October 2015. The Bureau of Meteorology, Geoscience Australia and Australia's emergency services have access to data from Himawari-8.

Image courtesy of Karin Reinke

▲ A prescribed burn in St Andrews, Victoria, which was used to assess how the 'structure from motion' technology assessed fuel loads pre and post-fire.

TET-1 and Himawari-8 are different types of satellites, explained Professor Jones, with each having its pros and cons.

"Himawari-8 is a geostationary satellite that is 36,000 km above the Earth's surface," said Professor Jones.

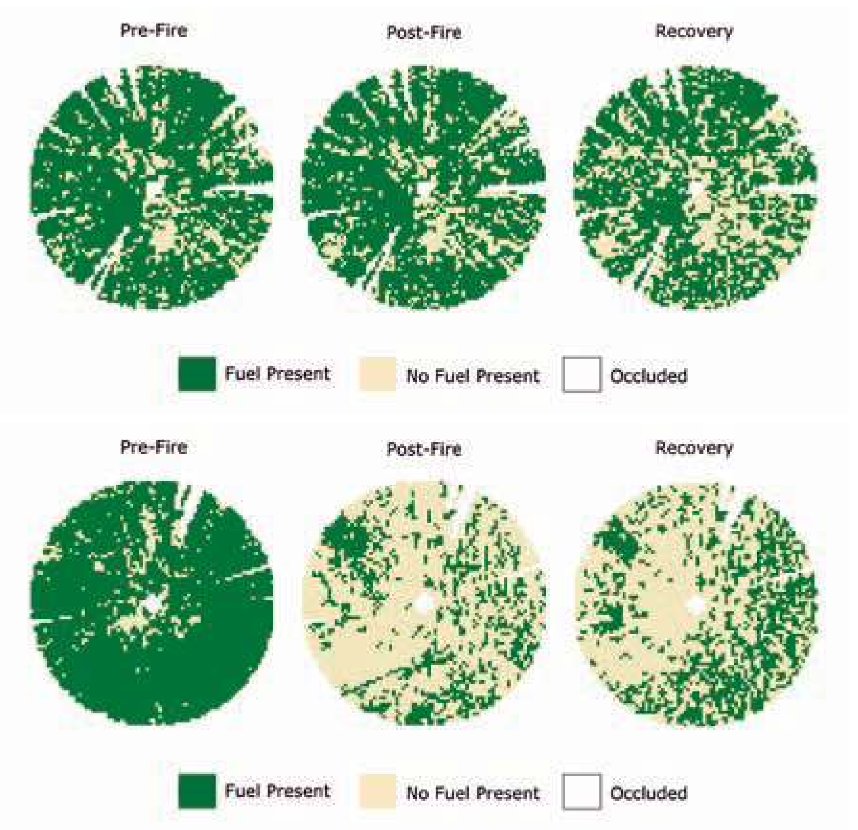
"Himawari-8 provides new imagery every 10 minutes, but at a relatively coarse spatial resolution. It is sitting in the same spot in the sky and continually observing an entire hemisphere of the Earth, while a polar orbiting satellite, such as TET-1, is much nearer to the Earth, between 600 and 1,000 km away, resulting in about 14 orbits a day.

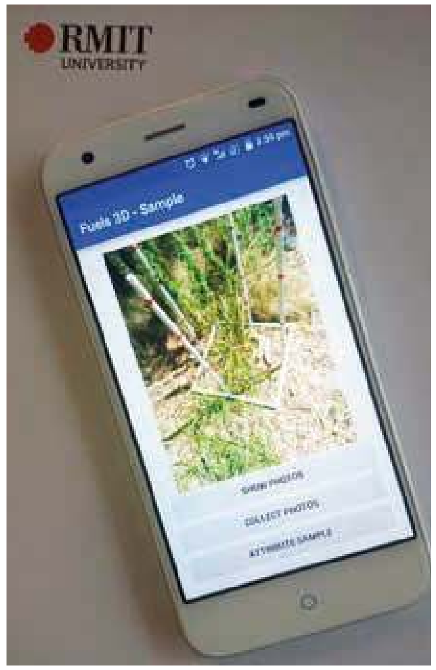
"For fire managers, this [TET-1] might mean a new image every couple of days, which is not brilliant for monitoring. But the benefit of the TET-1 satellite is that it provides a lot more spatial detail about the configuration of the fire.

"The key is firstly to understand what the utility of each of these platforms is for fire management, and secondly, in the long term, come up with a data assimilation approach where you can actually start to say 'how can we intelligently use all of this information together with all the other technologies available?' "

This study will help fire agencies

Figure 1 – Horizontal connectivity of surface and near-surface fuels





Images courtesy of Karin Reinke

▲ A sample of the beta version of the Fuels 3D app.

◀ The top line shows the control plot, without any fire present, but measured at the same time intervals as the test plot, shown on the bottom line.

understand which facets of the available satellite technology are useful for Australian conditions and which are not.

"It is about determining the confidence we can have in these products, where do they perform and at what point does their performance fall off?" explained Dr Reinke.

To assess this, the research team has designed several experiments. An important aspect of this is the work being done by RMIT and CRC PhD student Bryan Hally. Mr Hally has created a virtual computer environment to simulate fires in different landscapes from which equivalent satellite images based on system characteristics, or even hotspot products, can be generated. This approach helps to negate some of the logistical and timing constraints posed by working with fire and satellites.

"Being on the ground [at a fire] at the instant the orbiting satellite goes over is really hard to achieve," Professor Jones said.

"Because of that we use the simulated fire landscapes. We can then impose on them different viewing angles, different pixel sizes and different sensor bandwidths to try to understand what a fire looks like for all of the different satellites available for fire observation, and ultimately compare these back to the true, original fire landscapes. We can do this hundreds of times so we achieve a statistically valid representation of performance. This approach can be extended to evaluate future satellite sensors."

This analytical ability will greatly benefit fire and land management agencies around the country.

"Through our simulations we can begin to understand the potential performance of the different satellites," explained Dr Reinke.

"For example, we might say 'you know what, this is going to be great for the Mallee, but the minute we hit the tall closed forests, it is going to have limited value until fires get to a size where sufficient energy comes through the canopy for the satellite to detect accurately'.

"The simulated landscapes and imagery can also be used as a test bed to validate new hotspot algorithms and help improve hotspot algorithms for Australian conditions, because many of the existing algorithms are designed to be global products," said Dr Reinke.

To allow for empirical observations, the team is conducting field experiments under the satellites' pass, to determine how accurately they calculate (see Figure 1). This is a crucial part of the process in validating the algorithms.

"It is building up these case studies that we can use to empirically validate algorithm development," outlined Dr Reinke.

"It is difficult to obtain comprehensive ground-truthing data unless we can time it around prescribed burns. Even then this is challenging. So in addition to prescribed burns we also create our own fire experiments that are spatially fixed. These are essentially bonfires of different sizes, intensities and configurations.

"With a fixed fire the logistics are relatively easy, and we will do some more fixed fire testing once we are outside of the fire season. But we also want to apply our validation to prescribed burns. We are hoping to work with CFA, the Department of Environment, Land, Water and Planning, and Melbourne Water in Victoria, DEWNR in South Australia and ACT Parks and Wildlife on this."

➘ For more information, go to www.bnhcrc.com.au

SEE THE CLARITY.
Bullard
368 F
1200
900
600
300
X FACTOR
THERMAL IMAGERS
UPGRADE
Upgrade your Bullard TI at an affordable price
TRADE-IN
Get credit for trading in Bullard and other TIs
5-YEAR WARRANTY
5-year full TI warranty
Bullard®
Learn more at www.bullard.com/xfactor

PAB Akrapović

When conditions are at their worst,
we are at our best.

THINKING
AHEAD
firefighting series

PAB FIRE COMPACT
EN 443:2008, EN 14458:2004, MED Approved

Designed to protect the head under the most extreme conditions. Optimal relationship between protection and comfort with a broad spectrum of optional upgrades. Structural firefighting has never been safer. Now available worldwide!

PAB Akrapović | Most 26, HR-52420 Buzet, Croatia | info@pab.hr | www.pab.hr

SINCE 1953

What is your firefighting philosophy?

As I travel the world researching advancements in PPC/PPE, I often hear firefighters seeking the very latest technology in the component makeup of firefighting gear. Sometimes this is a quantum leap from where they currently are. This time of enhancement and upgrading is quite exciting and presents a golden opportunity often missed by fire departments.

Mark L. Gribble

I have seen a number of the larger departments take good advantage of latest technology, only to continue to apply 1950's firefighting practices. In real and holistic terms of the firefighter's protection, this can devalue the investment in PPE/PPC by as much as 25%.

Some departments occasionally ask manufacturers or Standards bodies to overcome or resolve a particular safety problem, when a portion of the resolution can be found in updating operational practices.

One of the key ways to optimise the value of the protection of the firefighter, as well as the purchase, is to review your firefighting philosophy and therefore practices. We often hear that this occurs directly after a "line of duty death", but PPE upgrades provide the perfect opportunity to get the most out of the enhanced protection.

Very often a forensic analyses of a "near miss" report, has led departments to target a preferred outcome in operational practices that can be assisted by the purchase of improved technology. One of the better examples of this is fireground accountability, and the movement from B/A tallies with unrealistic manual air use calculations, to telemetry with tracking and real time air use monitoring.

The same can be said for Structural Firefighting PPC. When this clothing changed to better protect firefighters some time ago, a few firefighters still wanted to expose some skin to feel the effects of the fire, to gauge the severity of their hostile work environment. A far safer practice was the comprehensive use of Thermal Imaging Cameras (TIC), which was seen to better optimise firefighter protection as well as the component technology in the PPC.

So what is your departments Firefighting philosophy and how does that form part of your protection and what does that mean when purchasing PPE? Do you deliver a

▼ **What PPC/PPE is required for the task?**

© Image courtesy of Mark L. Gribble

Mark L. Gibble is a member of the International Standards Organisation (ISO) and Standards Australia representative for firefighting PPE.

Image courtesy of Mark L. Gribble

▲ **Thermal impacts can be severe on Structural Firefighting PPC.**

high-risk offensive attack on all structural fires, all the time every time? Or do you have a balanced "Risk Vs. Gain" approach, which delivers a considered amount of risk, which is directly proportional to the potential or likely outcomes. From this consideration one should not assume that we should be any less protected from the "unforseen" fire phenomena, by purchasing inferior quality or lower performance components. A balanced and well considered firefighting philosophy simply reduces the frequency of potentially hazardous exposures.

Training and experience also plays a critical part in our Firefighting philosophy and therefore our use of PPC. Live fire training provides an individual firefighter a good understanding of the critical link between their body's performance and their PPC protection performance at given work rates in certain fire environments. Interestingly training often focuses on the more frequent fire scenarios. The below table shows why there may need to be more training in the Low Frequency (LF) and High Risk (HR) scenarios.

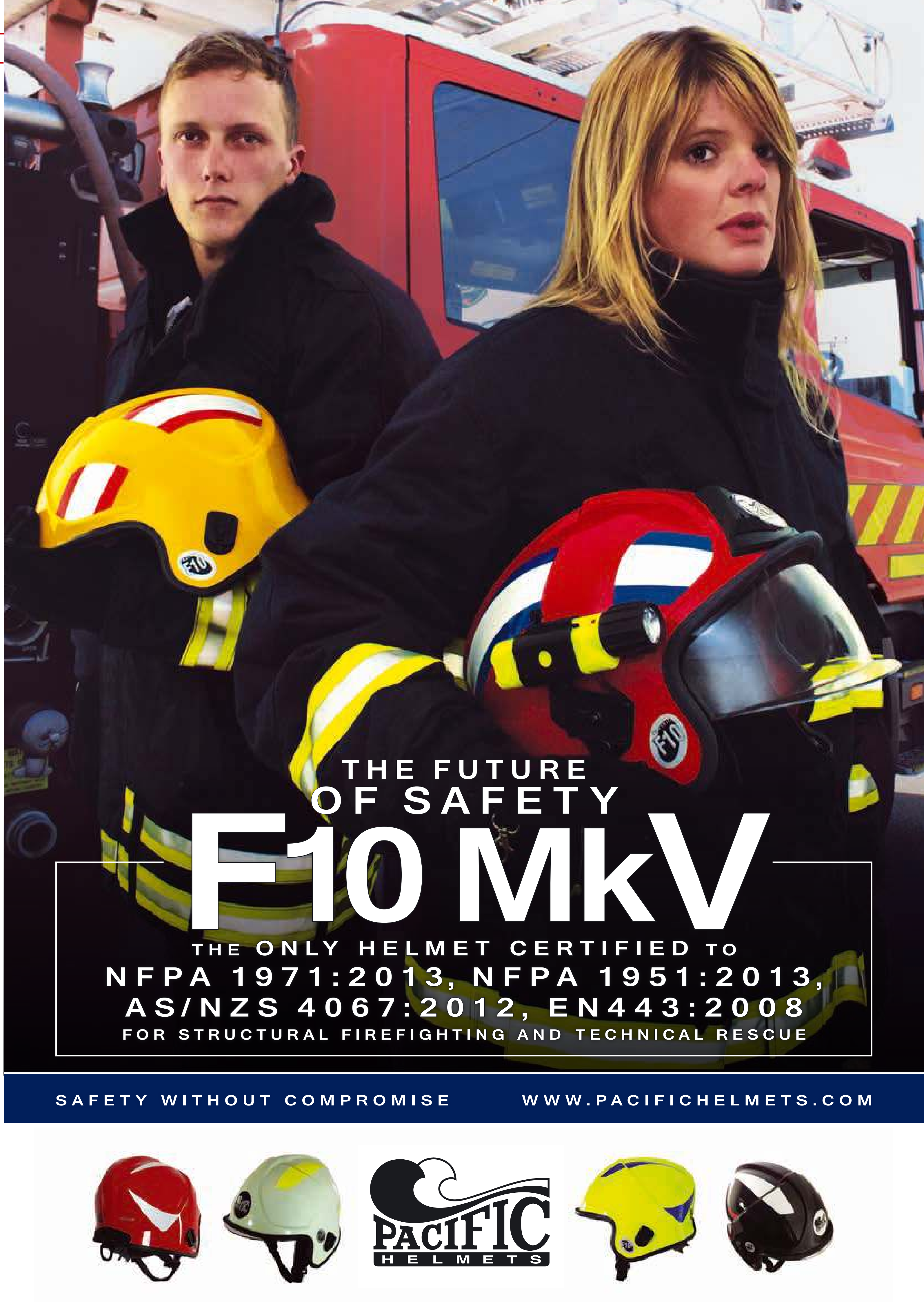
- For those firefighters in stations/departments who encounter mostly LF & LR incidents, likelihood of damaging exposures is lower due to the mostly lower risk.

LF LR	HF HR
LF HR	HF LR

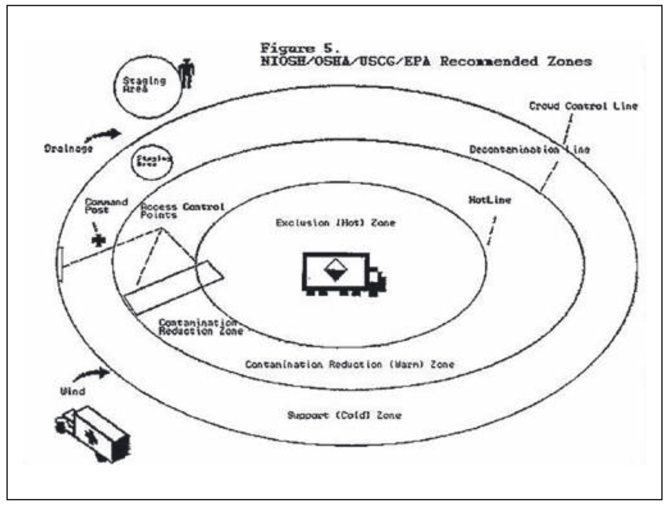
- For those firefighters in stations/departments who encounter mostly HF & LR incidents, likelihood of damaging exposures is lower as they are gaining experience and the incident risks are mostly low.
- For those firefighters in stations/departments who encounter mostly HF & HR incidents, likelihood of damaging exposures is slightly higher, but they are gaining experience to deal with the higher risk.
- However the combination of LF & HR, are the circumstances, which sees the likelihood of damaging exposures being much higher.

Therefore training based on well identified risk assessments, will serve to assist in the protection of firefighters.

Just as training plays a critical role, so to does staffing and response and is also linked to the type of PPC within a department and the exposure on firefighters. This is very evident in the excellent landmark residential fire studies released in April 2010, by the US Department of Commerce's National Institute of Standards and Technology (NIST) in conjunction with the IAFF, IAFC, WPI and CFAI Risk. These studies are amongst the most valuable studies to be conducted in our firefighting service/industry anywhere in the world. It clearly shows and quantifies what we have always felt and known about reduced crew sizes. Governments often focus on the "time of response" but often forget the other critical component in the service delivery equation. This is the "weight of response." These studies, both the High Rise study and the Fireground Field Experiments, prove that the size of the Firefighting crews has a substantial effect on the fire service's ability to protect lives and properties in residential and high rise fires. They were conducted by a broad coalition in the scientific, firefighting and public safety communities. The studies found that 4 person Firefighting crews were able to complete the 22 essential firefighting and rescue tasks in a typical residential structure 30% faster than 2 person crews and 25 % faster than 3 person crews. It also highlighted the increases in heart rate and thermal loads placed upon firefighters who tried to complete the tasks, with diminished crew sizes. These physiological effects on firefighters are directly linked



THE FUTURE OF SAFETY
F10 MkV
THE ONLY HELMET CERTIFIED TO
NFPA 1971:2013, NFPA 1951:2013,
AS/NZS 4067:2012, EN443:2008
FOR STRUCTURAL FIREFIGHTING AND TECHNICAL RESCUE
SAFETY WITHOUT COMPROMISE
WWW.PACIFICHELMETS.COM
PACIFIC HELMETS



Images courtesy of Mark L. Gribble

▲ **Just one of many examples of “Hot, Warm and Cold Zones.”**

◀ **An example of just some of the elements of a Structural Firefighting Ensemble.**

to crews sizes and highlights the real need to have correct crew sizes as well as the best possible Structural Firefighting PPC including station uniform.

The culture of Firefighting philosophy should change as a department grows to meet the needs of the community. The old adage of first in last out is rapidly disappearing. Some contemporary fire services have moved to “alarm”/ responses increasing in increments of odd numbers. This caters for far better dedicated functions on the fireground with better rotations of crews.

To further assist in the protection of firefighters, many fire services/firefighters are formalising the “Hot, Warm and Cold Zones” demarcation into their command strategies. This strategy, which has been in use for a long time in Haz-Mat incidents, is greatly assisting in improved “Dynamic Risk Assessments” in all emergency incidents.

The “Hot Zone” doesn’t always have to mean the presence of heat. It could simply be described as “the area of an emergency incident, with hazards or potential hazards, that have the ability or potential to cause the firefighter or the public to be exposed to damage, trauma or injury”.

It can even be applied to a simple but often highly visual and traumatic road traffic crash (RTC) or Motor Vehicle Accident (MVA). The Incident Controller/Commander may wish to limit the number of firefighters exposed to a highly traumatic incident to just those needed to achieve the task, in the interest of the mental health of fire and rescue responders.

Segregating the incident into these zones certainly assists with managing the issue of maintaining the correct PPC/PPE. At a structural fire if you are in “*the area of an emergency incident, with hazards or potential hazards, that have the ability or potential to cause you to be exposed to damage, or injury*” then you need to be protected by wearing your structural firefighting ensemble.

Especially if the exposure risk is any one or a combination of the following;

- Heat
- Flame
- Chemicals
- Water
- Blood Bourn Pathogens
- Or Carcinogenic Particulate Matter.

When referring to Structural Firefighting Personal Protective Clothing, “Structural” often means “All structures fixed or mobile and includes all things from the “*built environment*,” i.e. transportation, bridges, or even rubbish bin fires. They are those incidents which require heat flame, moisture, chemical, blood bourn pathogens, particulate material and respiratory protection at a higher level than Wildland Firefighting.”

I occasionally hear that “*my turn out gear is hot*”! However when we explore what tasks were being performed for the majority of the time they felt hot, they were very often carrying out ancillary or supportive tasks that were being conducted in the Warm or Cold Zone of the incident.

Contemporary and well trained fire services are confident enough to conduct Dynamic Risk Assessments of the tasks within the incident and not just the incident in general. This allows firefighters to wear the correct PPC/PPE that is required for the allocated task and not just have a blanket PPC/PPE requirement for the entire incident.

Therefore a well communicated and delineated “Hot, Warm and Cold Zone” on the incident ground, facilitates a far more appropriate selection of PPC.

The importance of these controls becomes critical on very hot days when a sensible Dressing Down Philosophy to correctly manage meta-bolic heat release issues, comes to the fore.

This will allow for the sensible different requirements of internal and external Firefighting activities in Structural Firefighting PPC/PPE in the Hot Zone, compared to patient care or incident management for example in a Cold Zone.

Stay safe until our next article on PPC/PPE.

For more information, email markgribble7@bigpond.com

Australian & New Zealand
SEARCH & RESCUE
CONFERENCE

1 June 2016
Jupiters, Gold Coast

The 2016 Australian & New Zealand Search and Rescue Conference (SAR16) will continue to provide a platform of discussion that began in 2015 for the Search and Rescue Community. The Conference aims to tackle the issues and challenges while continuing the support of professional development in new training, techniques and requirements of Search and Rescue.

The Committee will design the program to cover a range of topics varying from Water to Land to Air and Mining SAR missions. As the only trans-tasman multi-sector SAR Conference, this event allows the chance for all organisations and SAR workers to come together and continue our understanding of development in the SAR sector.

CONFERENCE FORUMS INCLUDE:

1. Technology and Operations
How are advancements in technology changing the way SAR operations are conducted?
2. Training
How do we ensure that people are appropriately trained and have the right skills for all different aspects of SAR?
3. Organisation
How do we enhance the interconnectedness between multiple SAR agencies to coordinate the most effective SAR response?
4. Working with Stakeholders
Lost Person Behaviour (Mental Health), Crisis Management and Communication Strategies

www.sar.anzdmc.com.au

Attend Australasia's premier emergency management conference backed by a globally recognised trade exhibition

AFAC16

mitigation • response • recovery

powered by INTERSCHUTZ

30 Aug – 2 Sept 2016

Brisbane Convention & Exhibition Centre

Mitigation – Response – Recovery: Getting the balance right

Find out more at:
www.afacconference.com.au

AFAC16 powered by INTERSCHUTZ features

- 2,000+ attendees
- 3 day multi-streamed AFAC16 conference program, including the Bushfire and Natural Hazards CRC Research Forum
- Post-conference development sessions including field trips
- Latest innovations on display in the trade exhibition powered by INTERSCHUTZ
- Networking events
- Expo Stage presentations
- Knowledge Lounge

Welcome Function Sponsor ISUZU TRUCKS

Lanyard Sponsor GAAM Emergency Products

afac

bushfire&natural HAZARDSCRC

Deutsche Messe

In 1987, Tempest became the first positive pressure ventilation fan used in firefighting. Today, we're proud to say we're still the most used and most trusted.

Tempest Technology Corp.
www.tempest.us.com

Planning for catastrophic disasters

The hallmarks of catastrophic disasters are death and destruction, large scale disruption of communities and businesses, the displacement of populations and public anxiety. Often they occur with little to no warning, overwhelming the capacity of institutions and the community to cope. Emergency leaders are posed with overwhelming issues, with complexity and uncertainty on a scale they likely have never experienced nor imagined. The event becomes subject to significant national and international media scrutiny, and inevitably, political involvement.

Andrew Gissing

Professor John McAneney

Andrew is the Director Government Business and Enterprise Risk Management at Risk Frontiers, an independent Research Centre set up as a R&D company at Macquarie University in Sydney, Australia. He works with Risk Frontiers clients to deliver pragmatic solutions to enhance disaster resilience.

John is the Managing Director of Risk Frontiers. John leads the Risk Frontiers team in their mission to assist clients to better understand and manage risks.

Catastrophic events are cascading in nature, escalating in their impacts as interconnected essential services fail yielding yet further impacts and making the recovery more complex and prolonged. Events may not respect borders or boundaries resulting in unclear accountabilities amongst responding agencies, and conflicting strategies and public messaging as different jurisdictions respond.

The recovery of communities may take many years, with many of the impacted population choosing to re-locate to other areas permanently. Economic losses can be severe as industry is disrupted, businesses close down and yet further demands for capital injections from Government to support recovery costs.

When managed poorly, a loss of public trust in officials may emerge with resulting political challenges. Official commissions of enquiry are held, which provide opportunities for improving systems, reducing risks and enhancing plans to better manage future events. Often, however, such learnings are forgotten as memory of the disaster fades only for many of the same issues to emerge as problems in the next event. The performance of leaders will be judged through the expectations of others with the obvious advantage of hindsight.

Australian catastrophic disaster risk

Luckily Australia has not historically suffered from large catastrophic events as experienced overseas such as the European 2003 Heatwave, the Asian 2004 Tsunami, the Christchurch 2010-2011 earthquake sequence and the Nepalese 2015 Earthquake. This luck may reflect a lower frequency of large earthquakes and low population densities, coupled with investments in disaster mitigation and warning systems. Australia has, however, experienced disasters that have clearly overwhelmed the ability of institutions to effectively respond: the Victorian Black Saturday Bushfires (2009) and the Queensland and Victorian floods (2011) offer recent examples. The 1974 destruction of Darwin by Cyclone Tracy was also a defining moment in Australia's emergency management history.

It is inevitable that more catastrophic disasters will occur. Significant grey risks are being created by increased urban development in at-risk areas. Our understanding of disaster risks tells us that events greater than those previously recorded are possible. This knowledge may be flawed or our imaginations may fail us: how many, for example, predicted the events of September 11 or how the Tōhoku earthquake and tsunami would unfold?

In the remainder of this article we consider some key aspects of planning for catastrophic disasters in the context of Australia.

Planning for catastrophe

Catastrophic disasters are different from every day disasters. Response strategies that routinely work in smaller events will be quickly overwhelmed and ineffective. The role of emergency management agencies becomes focused on providing leadership, facilitation, subject matter expertise, public information and warnings, and specialist resources. In the United States a government-centric approach has been recognised as being insufficient to meet the challenges posed by large disasters. Government is only one part of the overall team; and that arrangements must leverage all of the resources available. Responsibilities for community safety must be shared.

While emergency planning in Australian has traditionally been inwardly focused on the roles, responsibilities and strategies of emergency services and Government Departments, here too there is an emerging theme of community-based planning that aims to link locally- based response initiatives with wider Government-led emergency plans. No single agency is capable of responding to such high impact events alone and a whole-of-Government response in partnership with the community will be the only answer.

Ultimately, the ability to withstand and recover quickly from a catastrophic disaster comes back to the resilience of the impacted community and it is important that emergency management leaders tap into and exploit capability within the community, including local knowledge. These capabilities may not, however, be well-organised prior to the event occurring and this makes it difficult for emergent groups to be recognised in advance within disaster plans. Emergency management agencies should, however, proactively support the emergence of such groups, and have arrangements in place to work with them.

Catastrophic disaster risk assessments need to be based upon realistic assumptions; for example how long will the community be isolated? What is the expected number of casualties and damaged buildings? What might be the extent of infrastructure disruption and how long will it be down?

Scenario modelling approaches should be utilised: scenario planning combines sophisticated modelling techniques together with imagination and experience drawn from other large events both here and overseas. Risk Frontiers, with funding from the Australian Bushfire and Natural Hazards Cooperative Research Centre, is currently completing a series of disaster scenarios of national significance in Australia to assist emergency managers conceptualise and imagine catastrophic disaster risks. Some of these scenarios were published in the January edition of the Asia Pacific Fire Magazine.

Plans must be based upon an understanding about how a disaster event may unfold, in other words a dynamic view of the event is needed rather than just a static snapshot of the maximum consequences that may occur. For example, a catastrophic flood in Sydney may begin with a series of smaller flood and storm events that saturate catchments, fill water storages and steadily fatigue emergency resources, before the truly large flood occurs.

Plans must also be dynamic and able to adapt to unforeseen circumstances, complex variability and uncertainty. They also need to define the accountabilities of stakeholders.

A small number of specific disaster plans already exist for catastrophic scenarios such as for severe flooding in Hawkesbury Nepean Valley in Western Sydney. These plans consider consequences across wider regional areas spanning multiple Local Government Areas and assist to place the overall risks in sharper focus.

▼ **Damage from Asian Tsunami 2004.**

Image courtesy of Andrew Gissing and Professor John McAneney

▲ **Damage from Christchurch Earthquake 2011.**

Image courtesy of Andrew Gissing and Professor John McAneney

Testing of capabilities utilising realistic disaster scenarios will help identify gaps and improve the knowledge of institutions as to the limitations of their capabilities. Planners must consider wider jurisdictional and national capabilities. In some instances public-private partnership arrangements may supplement capabilities. Corporations through their corporate social responsibility programs can enhance community resilience and responses to disasters, such as the efforts of Wal-Mart after the impact of Hurricane Katrina in the United States. Other examples include Facebook establishing a safety check application for people to report that they are safe following a disaster, and Airbnb launching an initiative to coordinate emergency accommodation and relief in disaster affected areas.

International support arrangements have not been well recognised within jurisdictional planning for emergencies in Australia but may be essential after catastrophic events. How such resources link in with overall jurisdictional based arrangements requires better definition.

Building an effective surge capacity also requires a national focus on interoperability. Although progress has been made in this area, these efforts need to extend nationally to ensure seamless operations, and effective inter-jurisdictional deployments by utilising common systems, intelligence, equipment, processes and management structures.

Measures should be considered to regularly evaluate, measure and publically report on disaster preparedness and capability to provide transparency of the readiness of public institutions to respond to catastrophic disasters. Such reporting is now common in the United States but Western Australia is the only State in Australia to do this.

Conclusion

A catastrophic disaster in Australia is inevitable at some point. This might comprise a significant earthquake in a major metropolitan area, contemporaneous flooding across multiple catchments, a season of especially large bushfires across many states that exhaust the capacity of emergency services, or a tropical cyclone with wind speeds well in excess of the construction design standards. It must be accepted that in such an event emergency management agencies will be overwhelmed and no single agency alone will be able to cope with the demands expected of it. That being the case emergency management agencies will need to recognise their limitations and perform collectively in concert with the community. Emergency managers need to build strong bonds and trust with the community and private organisations, so that a whole-of-community approach can be employed. Importantly such response efforts should be accompanied by more investment in disaster mitigation including risk-informed land use planning to prevent amplifying existing catastrophic disaster risks.

For more information, go to www.riskfrontiers.com

Advanced incident management with ESIC

The lack of technical support during large fires is an ongoing problem for Fire Emergency Management Services, causing aggravation and impeding on the efficiency of their work. The need for fully functioning communications is indisputable and its improvement has been one of the main objectives for National Safety Agency (NSA) when developing the Emergency Services Integrated Communications (ESIC) vehicle.

Desmond Bahr

Des Bahr (President and Chairman of National Safety Agency) is a global professional with over 25 years experience in law enforcement, critical infrastructure resilience and emergency services.

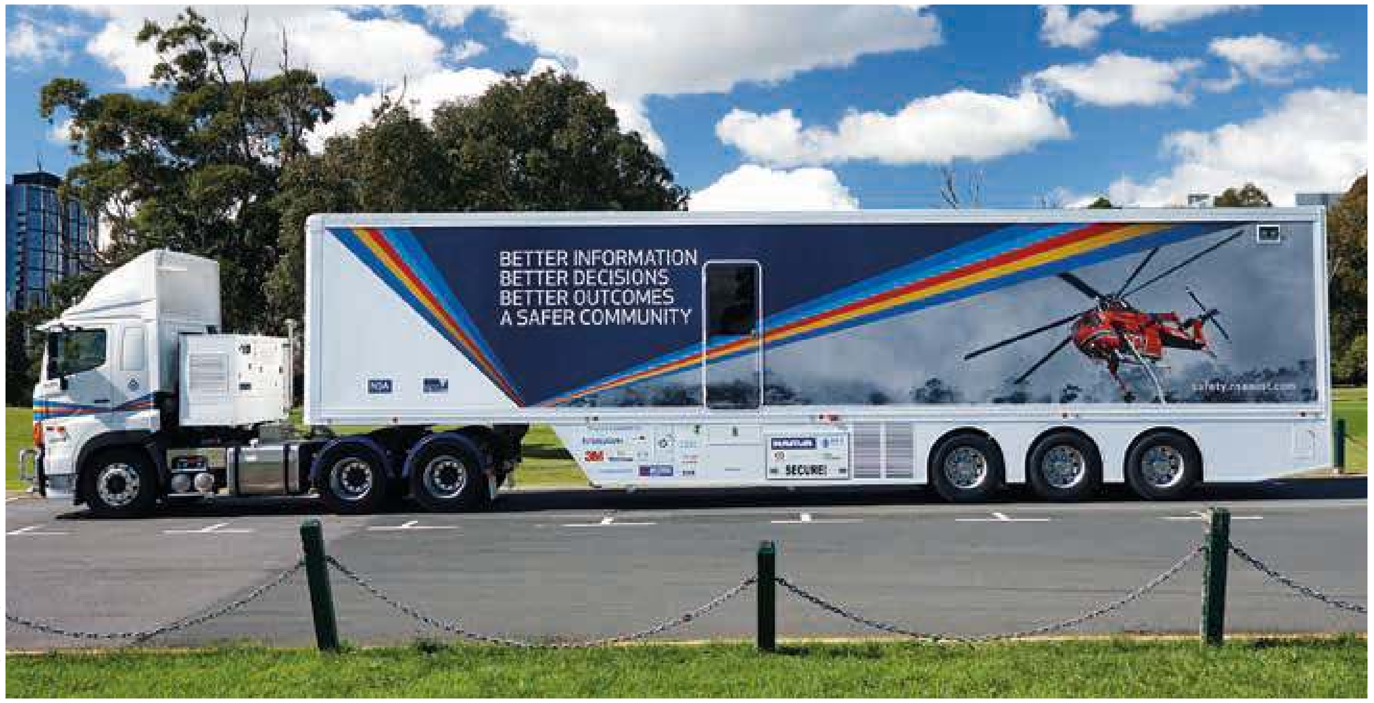
Recognised for his thought leadership and the brain's trust of innovative solutions, Des has worked with agencies around the world including Australia, the United States, the United Kingdom, Bahrain, the Kingdom of Saudi Arabia, the United Arab Emirates, Thailand and Singapore.

Supported by industry leaders through partnership, ongoing research and product evaluation, NSA introduced ESIC as an all-encompassing solution for Emergency Management Service agencies. The vehicle in form of a semi-trailer combines a range of industry leading solutions into one, providing a technology platform to improve the knowledge on incidents, supporting better decision making and establishing enhanced outcomes whilst ensuring safer and more resilient communities.

Fire Incident Management Teams are confronted with numerous challenges due to technology limitations, especially in remote and rural regions, where traditional terrestrial communications may not be available or heavily overloaded. Here, ESIC's unified communications abilities can be invaluable. The vehicle provides bandwidth and capacity using satellite connectivity and a long range 3G/4G antenna (NSA Pathfinder) to ensure important incident management information is processed, as well as supplying WiFi accessibility to communities in despair and an option to recharge mobile phones to displaced people who need to make contact with friends and relatives. Furthermore, cross-agency radio networks can be joined into user groups, so that response teams of all agencies can communicate using standard radios.

▼ NSA offers demonstration and training sessions in the fully equipped ESIC Control Room for all emergency management service agencies.

Image courtesy of NSA



Images courtesy of NSA

▲ The Emergency Services Integrated Communications (ESIC) Vehicle featuring a range of industry leading appliances integrated into a single solution.

According to an AFAC survey in 2015, a further issue agencies are successively confronted with is the shortfall in high quality incident simulations for knowledge development and training purposes. Such exercises have proven to be extremely important in enhancing the ability for decision making under pressure and efficient disaster management. ESIC offers advanced simulation and modelling functions to facilitate those activities. The onboard access to cloud-based computing power supports the simulation and modelling of fire behaviour and other adversities using large amounts of collected data and algorithm based models. Agencies are able to utilise ESIC not only for operational, but also training purposes on a lease basis, including a Mobile Support Vehicle (MSV) and the NSA support team.

Another area in need of development mentioned in the AFAC study is debriefs, which play an important role in the effective work of Fire Emergency Management Services. Debriefs are necessary to establish what was planned, retain the actual performance and the reasons behind it and determine the 'lessons learnt', another field ESIC can considerably assist with its many capabilities.

A compelling demonstration of ESIC's strong ability to provide multi-agency incident support was the vehicle's involvement in the 2014 Hazelwood Coal Mine Fires. Following an enquiry from Craig Lapsley, Emergency Management Victoria, to aid in covering the critical demand for additional communications capabilities onsite, the ESIC vehicle was set up adjacent to the Country Fire Authority's (CFA) Incident Control Centre (ICC), providing a wide range of support communications services within 30 minutes of arrival. The Incident Management Team experienced various typical issues, including limited 3G/4G coverage, restricting their ability to make and receive calls via mobile phones, limited access to emergency management tools, and restrained access to fixed phones within the Hazelwood facility. During its deployment, ESIC was able to assist with these and other challenges, supporting the team onsite and ensuring a better way of working and improved results for everyone involved.

▼ Full briefing using centralised data.

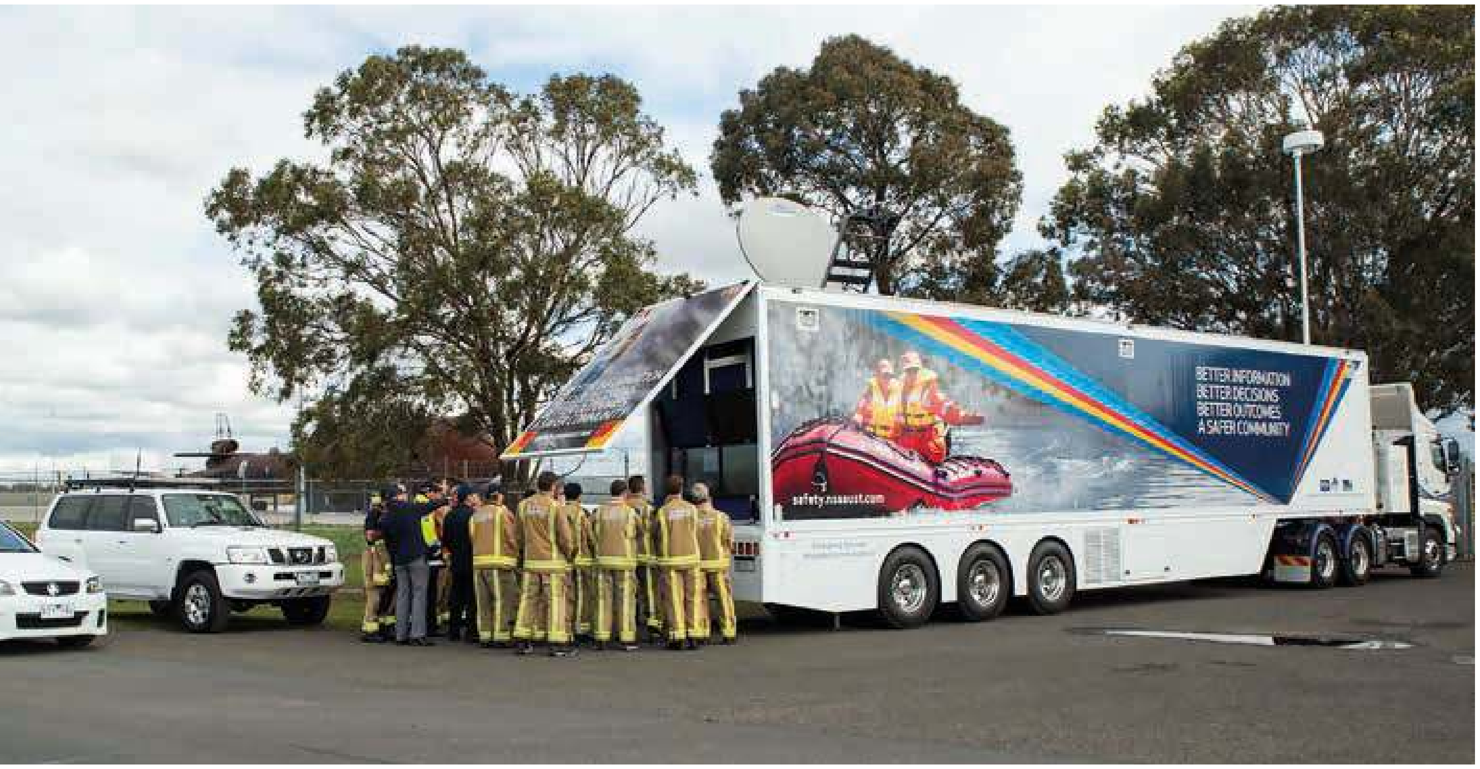


Image courtesy of NSA

▲ **The Mobile Support Vehicle (MSV) presents a great addition to the functions and capabilities of ESIC, offering some of the same features to further assist the Incident Management Team onsite.**

The lack of internet and WiFi access, hindering the agencies to maintain communications and access invaluable IT support systems, was overcome with the NSA Pathfinder and ESIC's satellite capability, accessing alternative towers to bypass congestion and securing high speed wireless access points. The Incident Management Team also experienced a shortage of computing equipment and suitable staff briefing areas, influencing their effectiveness in decision making and resulting actions. ESIC's onboard control and intelligence room provided them with satellite mapping, radio and television access, live video broadcasting and State Control Centre access, and acted as versatile, fit for purpose briefing area, providing timely services and an improved level of information.

The adjacent audio and video conferencing room further enabled the team to directly interact with the Bureau of Meteorology and share real-time visual evidence to collect data on prevailing weather conditions and create weather forecasts to provide concise and relevant information to operational staff and the community. Beyond that, ESIC's Infrared (IR) Camera Technology produced real-time imagery to identify coal fire hot spots and was streamed live to the ICC and State Control Centre (SCC) for instant decision making, evading the usual process time of several hours and enabling response agencies to act quickly.

The collected data and vision, including images from UAV's, was then to be delivered to the ICC and SCC teams, where NSA's Mobile Support Vehicle (MSV) with its remote access to telecommunications and onboard real-time streaming capabilities came into play. Previous transportation by road resulted in the material being made available at the earliest after 24 hours, whilst the combination of ESIC and MSV ensured a much shorter timeframe. This mobile, flexible unit complementing the functionality of the ESIC vehicle enabled the response teams to share valuable information quickly and store data for review and training purposes, further improving their decision making onsite.

The Incident Management Teams also needed support in identifying the position of personnel on the fire ground to ensure the crew's safety at all times. ESIC's asset management and abilities to live track mobile devices (when authorised by the owner enforced the safety and effectiveness of personnel working at the incident.

The Emergency Services Integrated Communications Vehicle will be attending several industry events within the next weeks, including the Australian and New Zealand Disaster Management Conference at the Gold Coast in May 2016. Further information and additional dates can be found on the NSA website (www.nsaaust.com).

National Safety Agency (NSA) is a Not-for-Profit organisation working in the areas of public safety, critical infrastructure resilience (CIR) and homeland security all over the world. Our partners and customers include police, ambulance, fire services, security and military agencies, civil defence, local, state and federal authorities and bodies responsible for critical infrastructure protection inside and outside of government.

We support our clients by supplying strategic consultancy, expert analysis and solution development, with innovative concepts providing tangible business outcomes. NSA works closely with the client to understand their needs and develop fit for purpose solutions to solve complex problems and deliver safer and more robust communities, achieving strong results aligned to each project.

For more information, go to www.nsaaust.com

SAPHIRE COMPLETE TRAINING CONCEPTS

FLASHOVER UNIT – NOZZLE UNIT – EMISSION CONTROL – WOOD-FIRED TRAININGOBJECTS – GAS-FIRED TRAININGOBJECTS

CLEAN EMISSION

Flashover- & Nozzle-unit at ROYAL NETHERLANDS NAVY training school.

Highrise training unit at Gooi & Vechtstreek Safety region's fire training ground.

Basic fire fighting training unit stationed at Metropolitan Fire department Istanbul-Turkey.

CREATORS OF TRAINING HARDWARE

SAPHIRE is building up a global reputation as a valued developer and manufacturer of standard and XpertBuild training modules. One of SAPHIRE's unique characteristics is that it offers services to a range of industries including the world of fire-fighting, renewable energy industry and the offshore- and maritime industry. Visit our website to view our range of products and services.

BRIELLE - THE NETHERLANDS
WWW.SAPHIRE-CTC.COM

ZIAMATIC MOUNTING SOLUTIONS

Field Tested. Field Proven.

Hand Tools
Struts
Ladders
Nozzles
Chainsaws
Safety Cans
Generators
Couplings
Hard Sleeves
Extrication Tools
and so much more!

Zico
Ziamatic Corp

1-800-711-FIRE | ziamatic.com

The response to maritime environmental emergencies: A multi-sectoral approach

Australia has a high dependence on its maritime industries for continued prosperity. During 2014/15, there were over 30,000 ship arrivals to Australian ports, placing Australia as the fifth largest shipping nation. In addition, Australia has a significant offshore petroleum industry, producing both oil and gas, which is critical to the countries energy security. While highly important to economic growth, these industries do present significant risks to the natural environment and community in not managed correctly.

Jamie Storrie

Jamie Storrie is Manager, Marine Environment Pollution Response, Australian Maritime Safety Authority.

The maritime and offshore petroleum industries are highly regulated, through a mixture of international conventions and domestic legislation. However as had been demonstrated in the past, safety regimes can fail and the impacts of large oil and chemical spills can be long-lasting. Australia, through the National Plan for Maritime Environmental Emergencies ('the National Plan'), maintains a national system to respond and recover from these events when they happen.

History of the national plan

The Liberian-flagged tanker Oceanic Grandeur struck an uncharted rock in the Torres Strait, northern Great Barrier Reef on 3 March 1970. Eight of the fifteen cargo tanks were ruptured on impact and an estimated 1100-1400m3 of crude oil was spilled. The response operation, conducted by the Queensland Government, was the first of its kind conducted in Australia. The effects of the incident are not well understood, but it is generally accepted that significant economic damage occurred to the pearl industry of the Torres Strait as a result.

This incident led directly to the development and implementation of the original National Plan for the Combat of the Pollution of the Sea by Oil in 1973. The National Plan was conceived as a national arrangement to coordinate the resources of all relevant stakeholders, government and industry, to manage oil spill incidents and from inception included national equipment stockpiles and common approaches to management and training. The National Plan was later extended to include Noxious and Hazardous Substances in 1998.

▼ It does not take a large spill to cause a large problem.

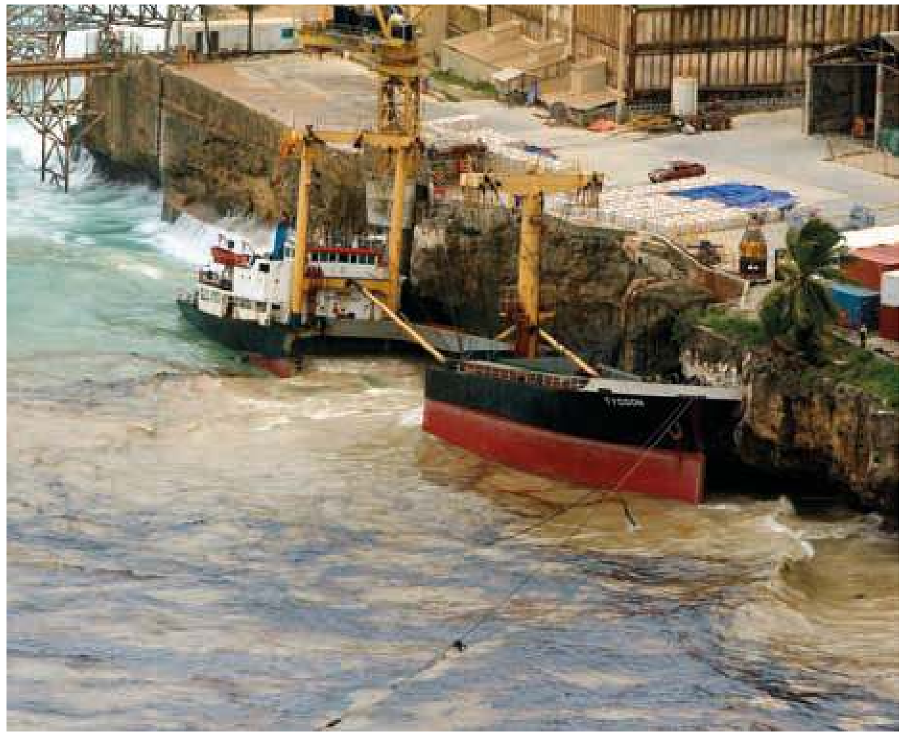


Image courtesy of Jamie Storrie

Figure 1 – Australian Risk Profile 2011 (DNV 2011)

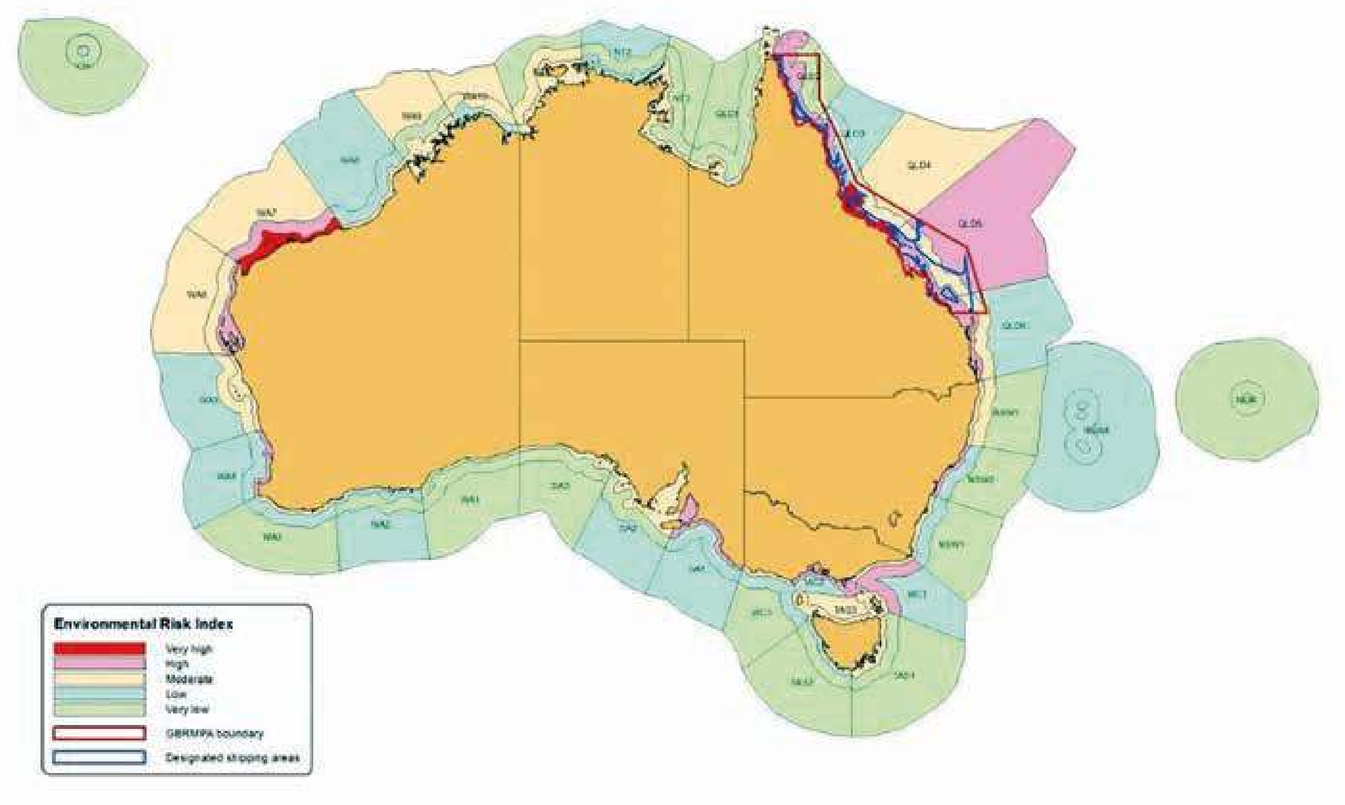


Image courtesy of Jamie Storrie

The national maritime emergency response arrangements

Based on the National Plan approach, the National Maritime Emergency Response Arrangements (NMERA) came into effect in 2008 and set out nationally agreed arrangements for the management of maritime casualties. These arrangements include the establishment of national legislation to support the response to maritime casualties, a national emergency towage capability and integrated management between governments and the shipping, port and salvage industries.

A unique feature of the NMERA is the designation of the Maritime Emergency Response Commander (MERCOM), within the Australian Maritime Safety Authority (AMSA), as the national decision maker responsible for coordinating the emergency response to maritime casualties. While the States and Northern Territory have responsibility for the management of maritime casualties within their respective jurisdictions, the MERCOM has authority to intervene where it is deemed to be in the national interest to do so. This is a direct response to incidents such as the sinking of the tanker Presitge (Spain) where local interests overrode the effective management of the casualty resulting in its loss and a 77,000m3 oil spill impacting three countries – Spain, Portugal and France.

Preparing for maritime environmental emergencies

Maritime environmental emergencies are events that have the potential to cause harm to the marine environment and/or community from the release of oil or hazardous and noxious substance from either shipping or offshore petroleum activities. Maritime environmental emergencies have a number of synergies with land based disasters, however there are some significant differences which affect their management and need to be considered in planning. These include:

- Marine environment – the marine environment presents a range of challenges, both logistic and operational, that need to be overcome implement an effective response operation. Heavy sea and weather conditions, in particular, can make operations particularly hazardous.
- International context – the marine environment does not respect jurisdiction. In addition to the potential to cross internal Australian boundaries, oil spills can impact across international boundaries (e.g. Montara oil spill, Timor Sea, 2009). This creates significant issues in resource allocation, selection of response strategies and coordination.
- Commercial interests – the arrangements and knowledge to manage maritime casualties have been established over centuries and are largely delivered by the private sector. Commercial interest increases the complexity of the event and needs to be well understood and managed for effective resolution of an incident.
- Politicisation of the response – Almost unique to oil spill incidents, is the high level of politicisation of the response operations. In addition to the natural concerns of local communities who are impacted by these events and their

high profile, oil spills are often used by a range on groups to pursue a range of related issues. This high level of scrutiny presents significant challenges in managing public communications.

Review of the national plan

The National Plan and NMERA were subject to a comprehensive review in 2011/12. The Review was managed by a stakeholder group formed specifically for the purpose of reviewing the current arrangements and agreeing the future pathway. The Review was underpinned by two projects, funded by AMSA:

- National risk assessment (Det Norske Veritas, 2011).
- National capability assessment (AMSA, 2012).

National risk assessment

The risk assessment modelled the marine pollution threat to the Australian coastline over a ten year timeframe, breaking the coastline into 120 regions and sub-regions. The risk assessment identified a significant change in the national risk profile (Figure 1), with increased risk is six regions – northern Queensland, central and eastern Victoria, eastern South Australia, the north-west of Australia, the northern territory and Australia's offshore areas. The increased risk was driven to a large degree by increased minerals export and expansion of the offshore petroleum industry.

The risk assessment also identified trends within the various sectors of the maritime industry to determine how the risk profile could be expected to change over time (Figure 2). The model predicted significant increases in shipping risk by 2020 -91% for trading ships at sea and 141% for trading ships at port. However it also predicts a reduction in offshore petroleum risks associated with an overall decrease in crude oil production.

Capability review

Phase 2 of the Review assessed the adequacy of the National Plan and NMERA to provide an effective response to maritime casualty and marine pollution incidents. The Capability Assessment considered: included a comprehensive literature review and analysis of best practice, considered international developments and involved consultation with over 90 stakeholders from Government and industry.

National plan for maritime environmental emergencies

The National Plan for Maritime Environmental Emergencies is the outcome of the 2011/12 Review. The National Plan incorporated a number of key changes:

- Established a single response arrangement for the management of maritime casualty and marine pollution incidents.
- Enhanced governance and stakeholder engagement.
- Aligned maritime environmental emergencies with traditional emergency management arrangements.
- Addressed a range of capability gaps.

These issues are discussed briefly below.

Governance

The central strength of the National Plan is the integration of a diverse group of stakeholders and interests into single agreed response arrangement. An important driver for this outcome is a national governance structure which provides accountability and a transparent process for stakeholders to engage in decision making around the national arrangements. Effective governance is achieved through:

- Reporting to Australian Governments through the Council of Australian Governments arrangements.
- The establishment of a National Plan Strategic Coordination Committee comprising the Australian and State and Northern Territory Governments to set policy direction and oversee the implementation of the National Plan.
- Stakeholder engagement, through the formation of a Strategic Industry Advisory Committee.
- Establishment of technical committees, comprising technical expertise from government and industry, to support strategic decision making, on matters as diverse as operating protocols, training and development, selection of response equipment etc.
- Coordination structures within each State and the Northern Territory to implement the national arrangements at the regional and local level.

Integration into the Australian Emergency Management Arrangements

The National Plan has been historically been treated separate to the terrestrial emergencies. However this is no longer a viable approach. The National Plan has progressed integration with the Australian Emergency Management Arrangements as follows:

- Formal recognition of the National Plan as a supporting arrangement to broader emergency management.
- Adoption of AIIMS as the common incident management system.
- A greater emphasis on community and their expectations in planning for maritime environmental emergencies.
- Adoption of the comprehensive approach, encompassing the phases of prevention, preparedness, response and recovery.

Response Capability

National Equipment Stockpiles

The National Plan applies a tiered approach to the supply of response equipment, in that local and regional resources held within States and the Northern Territory and by individual companies are supplemented by nine national stockpiles managed by AMSA and a further industry stockpile managed by the Australian Marine Oil Spill Centre (AMOSC) on behalf of the oil industry. The national stockpiles have been redesigned and significantly upgraded since 2011 based on the following principles:

- Equipment and stockpiles to be standardised across the national stockpiles. Standard technical specifications were designed and national procurement process conducted which are utilised across National Plan stakeholders.
- The stockpile locations are based on a combination of risk and ease of logistics, particularly long haul transport and the provision of at least one stockpile positioned to enable international response.
- The stockpiles locations to enable the supply of resources to each high or very high risk area within 24 hours by road transport.
- Each stockpile to be supplemented by another stockpile within 48 hours by road transport.

MCH-6/EM
DRIVEN BY:
SINGLE-PHASE ELECTRIC MOTOR
CHARGING RATE:
100 L/min 6 m³/h
DIMENSIONS:
HEIGHT 35 cm
WIDTH 65 cm
DEPTH 39 cm
DRY WEIGHT: 39,5 Kg

MCH 16 ET COMPACT
DRIVEN BY:
THREE-PHASE ELECTRIC MOTOR
CHARGING RATE:
315 L/min 19 m³/h
DIMENSIONS:
HEIGHT 88 cm
WIDTH 92 cm
DEPTH 61 cm
DRY WEIGHT: 187 Kg

MCH 16 ET STANDARD
DRIVEN BY:
THREE-PHASE ELECTRIC MOTOR
CHARGING RATE:
315 L/min 19 m³/h
DIMENSIONS:
HEIGHT 63 cm
WIDTH 83 cm
DEPTH 43 cm
DRY WEIGHT: 100 Kg / 220.4 lbs

COLTRI™ ASIA PACIFIC
MADE IN ITALY

COLTRI ASIA PACIFIC Co., Ltd.
Free Zone at 304 Industrial Park 2 No. 94/5, Moo. 3, T. Khao Hin Sorn,
A .Phanomsarakarm, Chachoengsao 24120 Thailand
Tel: + 6638855103 to 5 Fax: + 6638855106 mobile +66818092311
robin@aerotecnicacoltriasiapacific.com
www.aerotecnicacoltriasiapacific.com

AEROTECNICA COLTRI® S.p.A.
via dei Colli Storic i 177 5010 San Martino della Battaglia Brescia - ITALY
Tel: +39.030.99.103.01 +39.030.99.102.97 Fax: +39.030.99.10.283
www.aerotecnicacoltri.it

Marine Approved Fire Control Panels

- 2-12 zone panels available
- Muster alarm zones
- Programmable delays to outputs
- Colour coded interface
- False alarm management
- Repeater panels

Find out more:
T: +44(0)1895 422066
E: international@haes-systems.co.uk
www.haes-systems.com

Image courtesy of Jamie Storrie

▲ **MV Tycoon Incident, Christmas Island, January 2012: Beach Clean-up at Flying Fish Cove.**

Fixed Wing Aerial Dispersant Capability

The applications of oil spill dispersants, while controversial in the public realm, remain the most effective means of treating large oil spills. AMSA and the Australian Institute of Petroleum (through AMOSC) jointly fund a standing fixed wing aerial dispersant capability (FWADC). Based around agricultural spray aircraft capacity, six aircraft, capable of low level flying over water, are on permanent stand-by around Australia.

The FWADC is being integrated with capabilities held by State and Northern Territory fire services, in particular the command and control provided by air attack supervisors in the rural fire services. This capability was recently exercised for two days off the coast of Exmouth, Western Australia.

Hazardous and Noxious Substance Response

The response to HNS remains a complex issue for the National Plan. Unlike oil spills, there is no standard approach to chemical response at sea and it is further complicated by significant human health and safety issues. A three staged approach to the management of marine chemical spill incidents has been adopted by the National Plan:

- Establishment of a marine chemical spill advisory service with an established hazardous material (HAZMAT) response agency (Level 1).
- Establishment of deployable teams of HAZMAT to assess and conduct 'first aid' management of shipboard chemical incidents (Level 2).
- Establishment of a response system to manage the releases of chemicals into the marine environment (Level 3).

The Level 1 and Level 2 capabilities are being implemented in partnership with the New South Wales Fire and Rescue Service.

National Response Team

The National Response Team (NRT) is a group of 64 response personnel drawn from the States and Northern Territory governments and the port industry that can be deployed in management or operational team leader roles in the event of a major pollution incident. The NRT has provided 'surge' support for Australian incidents since 1995. The NRT is supported by two specific programs:

- A succession program, whereby AMSA provides targeted training to State and Northern Territory responders to maintain a pool of personnel that can fill NRT vacancies when they occur.
- An exercise and training program for NRT members to maintain and develop the skills necessary to lead teams during major response operations.

The NRT has proven to be one of the major capabilities of the National Plan and has been deployed to all major recent incidents in Australia, as well deployment to the MSC Rena oil spillincident in New Zealand.

Training and exercising

In comparison to other emergency services, there is limited number of professional marine pollution responders. AMSA, for example, employs a small team of eleven specialists, while the majority of States and the Northern Territory have smaller teams again. The majority of response personnel are therefore employed for purposes other than marine pollution response.

The training of response personnel under the National Plan has, as a result, been developed to create a work force that can work interchangeably on a national basis, i.e. Victorian personnel can work in the Northern Territory, and vice versa. A nationally consistent training and exercising program has been developed to achieve this outcome.

Responsibilities for training under the National Plan can be summarised as follows:

- AMOSC delivers training for the offshore petroleum industry in line with standards accepted internationally by the oil industry. This reflects the movement of staff within that industry between countries and regions.
- AMSA is responsible for the delivery of incident management and senior executive training on behalf of the Australian, State and Northern Territory Governments.
- The States and Northern Territory are responsible for the delivery of operational response training with their jurisdiction.

Governmental sector training at all levels is delivered under the AMSA Registered Training Organisation to competency standards defined within the Public Safety Training Package. The training utilises a mix of competencies developed for the wider emergency management sector and those developed specifically for marine pollution response.

National Exercise

Regular exercising forms an important component of the National Plan. Exercising occurs at all levels – state, local and facilities – with a major exercise being held nationally to test national arrangements and inter-operability. The national exercise is another example of the cooperative approach underpinning the National Plan. The exercise, as a matter of principle, is managed jointly between the Australian and State Governments and the oil industry, with a focus on having integrated incident management and operational response teams.

The most recent national exercise, Exercise Westwind, focused on an offshore petroleum incident off the coast of Exmouth, Western Australia. Responders for the exercise were drawn from the oil industry and governments, and included international responders.

Conclusion

Since 2012 there has been a fundamental shift in the management of maritime environmental emergencies in Australia, not the least of which is the formal integration of maritime salvage and marine pollution arrangements into a single response system and the leveraging of the broader emergency management sector. The new arrangements, and the substantial stakeholder support underpinning their implementation, will ensure the continued success of the National Plan in protecting Australia's community and marine environment from marine pollution.

For more information, go to www.amsa.gov.au

TEXAS A&M ENGINEERING
TEEX
EXTENSION SERVICE

The International Fire & Emergency Training Leader

TEEX trains emergency response personnel from more than 45 countries each year!

Choose from over 130 courses including:

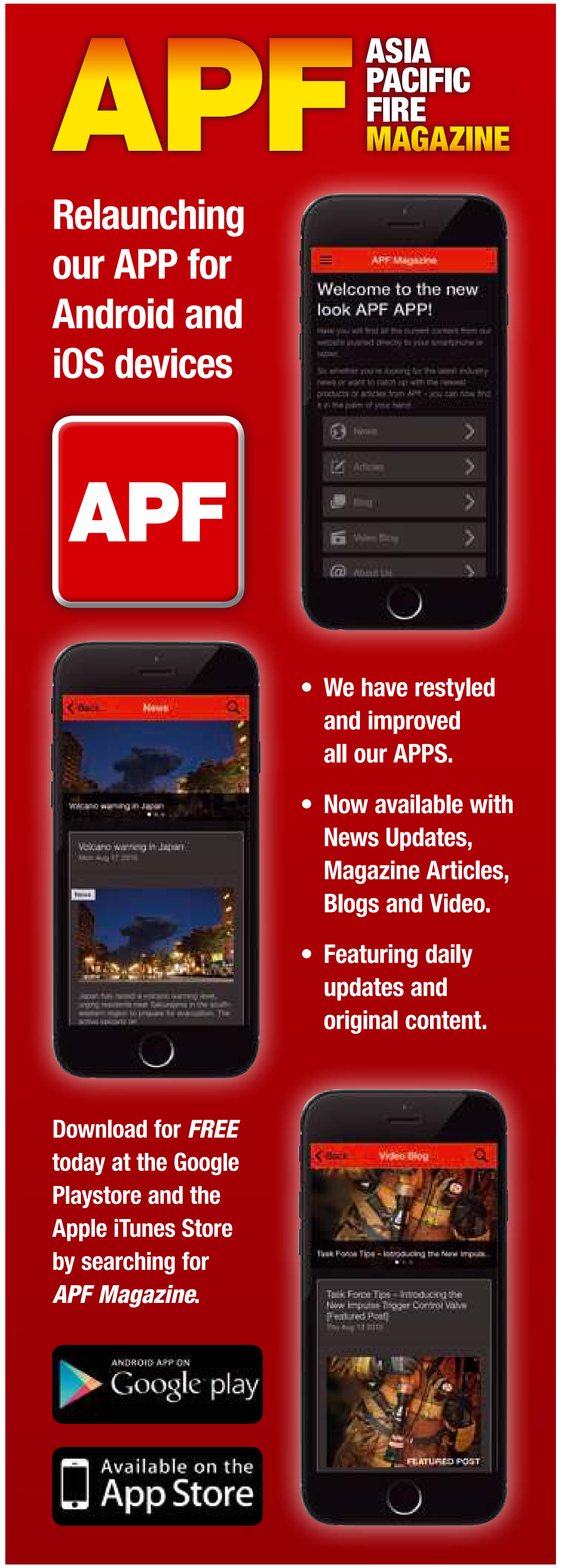
- Firefighting
- Emergency Medical Services
- Fire Investigator
- Fire Officer / Instructor
- Hazardous Materials Response
- Rescue / Urban Search & Rescue
- Industrial Emergency Response
- Marine / Oil Spill Response
- LNG Emergency Response
- NIMS / ICS
- Annual Spanish School
- Latin American Emergency Response
- Leadership

Each course can be tailored to meet your exact needs in a variety of areas

Schedule your classes and **Experience the HEAT!**

C13.6627.02

1-866-878-8900 www.teex.org/fire



APF ASIA PACIFIC FIRE MAGAZINE

Relaunching our APP for Android and iOS devices

- We have restyled and improved all our APPS.
- Now available with News Updates, Magazine Articles, Blogs and Video.
- Featuring daily updates and original content.

Download for *FREE* today at the Google Playstore and the Apple iTunes Store by searching for *APF Magazine*.

ANDROID APP ON Google play

Available on the App Store

APF
APF Magazine
Welcome to the new look APF APP!
News
Articles
Blog
Video Blog
About Us
Back
News
Volcano warning in Japan
Video Blog
Task Force Tips – Introducing the New Impulse Trigger Control Valve [Featured Post]
FEATURED POST

ADVERTISERS' INDEX

Advanced Electronics	2
AFAC 2016 Powered by Deutsche Messe	74
Australia & New Zealand Disaster Management Conference	17
Australia & New Zealand Search & Rescue Conference	73
Bauer Compressors Asia Pte. Ltd.	35
Bristol Uniforms Ltd.	53
Bullard Asia Pacific	67
Carrozzeria Chinetti S.r.l.	19
China Fire Safety 2016	21
Coltraco Ultrasonics	4
Coltri Asia Pacific Co. Ltd.	85
Cutters Edge	46
Dr. Sthamer Hamburg	29
Dynax Corporation	31
Exova Warringtonfire Aus Pty Ltd.	63
FFE	13
Fire Protection Association Australia	60
Firetrace International	6
Gradall SERV	41
Haes Systems	85
Hainsworth Technology	53
HD Fire Protect Pvt Ltd.	63
Holmatro Rescue Equipment	IBC
Janus Fire Systems	60
LHD Group Hong Kong Ltd.	44-45
MDM Publishing Ltd.	15
NewAge Fire Fighting Co. Ltd.	11
PAB Akrapovic	68
PAC Fire Australia	23
Pacific Helmets (NZ) Ltd.	71
Performance Advantage Company	56
Safe Fleet	28
Saphire Complete Training Concepts	81
Super Vacuum Manufacturing Co., Inc.	12
Task Force Tips, Inc.	IFC, 1
Teikoku I-Sen Co.	32
Tempest Technology Corporation	74
Texas A & M Emergency Services Training Institute	87
The Solberg Company	26
TLX Technologies	35
Tyco Fire Protection Products	OBC
Yone Corporation	49
Ziamatic Corporation	81

Come and see us at

FIREAUSTRALIA + HAZMAT
4-5 May • Melbourne, Australia

DISASTER & EMERGENCY MANAGEMENT
Australia & New Zealand SEARCH & RESCUE CONFERENCE
30 May - 1 June • Gold Coast, Australia

afac
30 August - 1 September • Brisbane, Australia

www.mdmpublishing.com

The 5th Generation Cutters

When it comes to the crunch, you can count on Holmatro cutters. Meet our Inclined Cutter CU 5050 i. Simply put its angle jaw in the right position for more ergonomic cutting of a car's roof or rocker channel. Or benefit from more room for tool movement when cutting pillars from the side. With a carrying handle that goes all-round this is easy: you can always use this cutter to your advantage, at all sides of the car.

You can count on us, for life
holmatro.com/en/cutters

Holmatro Rescue World

holmatro
mastering **power**

ZETTLER

Safer. Smarter. Tyco.™

ZETTLER
PROFILE

The next step in fire detection solutions

P	R	O	F	I	L	E
Powerful	Resilient	Operation Made Easy	Fast	Innovation	Life Time Cost	Environment

www.zettlerfire.com

tyco
Fire Protection Products

APF ASIA PACIFIC FIRE MAGAZINE

REPORTING TO THE ASIA PACIFIC FIRE PROTECTION AND FIRE SERVICE INDUSTRY

www.apfmag.com
Issue 58 • July 2016

Fixed Station and Portable Monitors • Master Stream Nozzles • Self Educting Foam Nozzles • LDH Hardware, Manifolds, Intake and Discharge Valves • Hazardous Location Monitors

Industrial Fire

FM APPROVED

NFPA #1964
Compliant

Nozzles • Valves, Wyes and Tees • Foam Equipment and CAFS Nozzles • Bumper Mount Monitors • Tools and Accessories

Wildland Fire

Intake Valves • Jumbo Wyes, Siamese and Gated Manifolds • Hydrant Assist Valves • Gated Wyes and Water Thiefs • Suction Hose and Strainers

Water Supply

Fixed, Selectable and Automatic • Standard, Low and Dual Pressure • Smooth Bores and Ball Valves • Pressure Gauges and Flow Indicators • Specialty Nozzles & Accessories

Handheld Nozzles

Fixed and Remote Control Monitors and Nozzles • Intake Valves, Adapters, Elbows and Fittings • Monitor Manifolds • Tools and Accessories

Fire Apparatus Equipment

TFT®
TASK FORCE TIPS®
FIRE FIGHTING EQUIPMENT

G-Force™

Foam Nozzles and Attachments • Eductors • Self-Educting Nozzles • Foam Injection and Application Systems

Foam Equipment

MADE IN USA

3701 INNOVATION WAY
VALPARAISO, IN U.S.A.

+1.219.548.4000

www.tft.com • www.newforce.tft.com

by: TASK FORCE TIPS

The Standard in Fire Systems

Axis EN
for the EN54 world

Axis AX
for the UL 864 world

Wherever ease-of-use, performance, and reliability are important, you'll find an Advanced intelligent fire system.

Our Axis systems include advances in synchronized audio, false alarm management and touchscreen graphics.

Advanced
The Standard in Fire Systems

Dubai Office
Dubai Airport Free Zone, Building W3,
Office 211, Dubai UAE
Tel: +971 4 299 0908
Fax: +971 4 299 0554

Email: sales@advancedco.com

UK and EMEAA HQ
Moorland Way, Cramlington,
Northumberland, NE23 1WE UK
Tel: +44 (0)1670 707 111
Fax: +44 (0)1670 707 222

Web: www.advancedco.com

Advanced

APF
ASIA PACIFIC FIRE MAGAZINE
REPORTING TO THE ASIA PACIFIC FIRE PROTECTION AND FIRE SERVICE INDUSTRY
www.apfmag.com
Issue 58 • July 2016

JULY 2016 • ISSUE 58

Cover image: Featuring the latest F15 structural firefighting helmet from Pacific Helmets. This helmet along with all your other PPE requirements are available from Pac Fire Australia. Featured items are Bristol Uniforms, Underwater Kinetics torch, Titan Firecom, Adaro torch, POK nozzle, ESKA gloves, YDS boots.

Image courtesy of Pacific Helmets (NZ) Ltd.

Publishers
Mark Seton
David Staddon

Editor
Neil Bibby **ASFM, FAICD, MIFireE**
neil.bibby@mdmpublishing.com

Contributing Editors
Dr Penny Burns, Javier Castro, John Cha, Kevin Cudby, Professor Lyn Gilbert, Dr Rebecca Harris, Freya Jones, Stuart Munro, Dr Timothy Neale, Jeff Perry, Dr Tom Remenyi, Brett Staines, Dr Melanie Taylor, John Turner, Duncan J. White, Scott Williams.

Design Manager
Richard Parsons
richard.parsons@mdmpublishing.com

Web and IT Manager
Neil Spinney
neil.spinney@mdmpublishing.com

International Sales
Mark Seton
mark.seton@mdmpublishing.com

Mark Bathard
mark.bathard@mdmpublishing.com

Dave Staddon
dave.staddon@mdmpublishing.com

APF is published quarterly by:
MDM Publishing Ltd
The Abbey Manor Business Centre,
The Abbey, Preston Road,
Yeovil, Somerset, BA20 2EN, UK.
Tel: +44 (0) 1935 426 428
Fax: +44 (0) 1935 426 926
Website: www.mdmpublishing.com

MDM Publishing Ltd (Australia)
23 Richardson Street, Lane Cove,
NSW 2066, Australia.
Tel: +61 (0) 418 358 465

©All rights reserved

ISSN – 1476-1386

DISCLAIMER: The views and opinions expressed in ASIA PACIFIC FIRE are not necessarily those of MDM Publishing Ltd. The magazine and publishers are in no way responsible or legally liable for any errors or anomalies made within the editorial by our authors. All articles are protected by copyright and written permission must be sought from the publishers for reprinting or any form of duplication of any of the magazines content. Any queries should be addressed in writing to the publishers.

Reprints of articles are available on request.
Prices on application to the Publishers.

Designed, Edited and Printed in the UK.

***FREE* Subscription**
To subscribe to APF Magazine and for unlimited access to our digital resources, please register at www.apfmag.com

PROUD TO BE A MEMBER OF
CFPA-Asia

Contents

JULY 2016

REGULARS

5 Editors Comment

7 Industry Comment

8 News and Profiles

FEATURES

28 GIS technology improves the workflow of emergency management

32 Marine firefighting with the Hong Kong Fire Service Department

37 Environmental selection and use of firefighting foams

43 Understanding future fire danger

48 AFAC16 Show Preview

74 Fire Services of Macao SAR, China

77 Mass decontamination in a public setting – making privacy a priority

80 Collaboratively managing our aerial firefighting resources

82 Hello, Emergency Services – why do you need recording solutions?

86 Remote access puts your fire system at your fingertips

90 Effective fire stopping solutions now better recognised in Asia

94 The social life of policy and planning

98 Australian fire app focuses on firefighter safety

101 Ebola 2013-2016 – how long will the memory last?

107 Firefighting foam concentrates – the constant evolution: Part 1

facebook LinkedIn twitter Google+

COLTRACO
Ultrasonics | since 1987
WWW.COLTRACO.COM

How do you test & maintain your fire suppression systems 365 days a year?

UL LISTED

PORTALEVEL™ MAX
Handheld ultrasonic liquid level indicator & for marine
Accuracy: +/-1.5mm
IS/ATEX coming soon

PERMALEVEL™ MULTIPLEX
Continuously monitor up to 700 cylinders ultrasonically
Total visibility 24/7, 365 days a year
Remote monitoring & diagnostics

PORTASTEELE™ CALCULATOR
First ever method to convert the liquid level into the agent weight
Easy to use tablet format
Used in tandem with Portalevel™ MAX

Seatrade Maritime Awards Asia

FINALISTS IN SEATRADE MARITIME AWARDS ASIA :
Safety Award
- Coltraco Ultrasonics
- Fleet Management Ltd
- Pacific Basin Shipping

Want more information? Quote APF58
Email: sales@coltraco.co.uk or Call: +44 207 629 8475

Assistance across borders

The Asia Pacific Fire Magazine covers the most disaster prone area in the world, we have it all; wildfires, industrial fires, cyclones, earthquakes, tsunamis, floods, mudslides, hazardous material, volcanos and terrorism, not much left to worry about. Many of these also occur as a flow on from a main event, thereby compounding our problems. e.g. tsunami from an earthquake or floods from a cyclone.

Neil Bibby
AFSM, FAICD, MIFireE
Editor

Emergency workers in the region meet often during conferences, attending training courses, competitions, international visits, standards meetings and many other events. At these events we talk about the emergency management family and like all good families we would like to think we could assist each other in times of trouble.

There are unfortunately, in the real world, some barriers to just being able to respond to assist a family member in need. International borders, different languages, different cultures and varied circumstances all detract from the ability to assist.

There are a number of different agreements and guides for cross-border assistance in the event of a disaster an example being the “2011, Disaster Response in Asia and the Pacific, a guide to international tools and services”. We also have some bilateral agreements between countries for assistance in the event of a disaster but most of these are limited to countries with similar languages and cultures.

As I travel around the region I see a massive number of resources that could be used to assist but in most cases they go underutilised. I’m not saying we don’t assist each other but are we doing all we can and what is stopping us? Over the past two decades emergency services that were struggling in the region have become sophisticated well trained and well equipped agencies and I don’t think there has been recognition or understanding of this change in the region.

In most disasters it is the first 48 hours, where people are trapped and/or injured, that expert intervention will make the most difference, from then on the death rate starts climbing rapidly. Therefore, this first two days is where our energies must go.

Wouldn’t this scenario be great? An earthquake occurs in our region and the following takes place, as soon as the call for assistance come in. Hopefully as soon as the event occurs preparation will be taking place in expectation of the call for assistance.

- So as not to be a burden on the affected countries all assistance is self-contained;
- A predetermined earthquake response is sent from the nearest nations qualified in USAR as well as significant personnel for support;
- The responding country has well practiced internal responding systems and the receiving country has similar well practiced systems for receiving aid;
- All countries have pre-planned and identified a number of sites for accommodation, marshalling and logistics to be set up immediately;
- Integrated command with local agencies are set up;
- Rapid assessment and deployment takes place (10 hr response from a neighbouring country);
- A second larger response has been planned and on the way (24 hr response);

I have attended many meetings where the barriers are highlighted, I don’t have the answers, but what I do know is that the scenario above is achievable. One of the areas in which we fall down is that all agencies would like to think they are ‘all hazard’ agencies. Is this a future? Why not specialise on top of first response capability? Countries could be experts in communication, camp management, logistics, incident control, mechanical repair and many other roles. This is not the glamour side of emergency management but we all know without these utilities working well everything comes to a stop.

Finally, is a quote from General Dwight D Eisenhower “A plan is nothing; planning is everything” The detail planning process for rapid deployment into a foreign country is where relationships will be build and depended upon during a disaster.

This should not be a country by country process but a coordinated regional approach, who will put their hand up to coordinate?

> **This should not be a country by country process but a coordinated regional approach, who will put their hand up to coordinate?**

For the urgent attention of Fire Alarm Service and Maintenance companies

Mandatory upgrade to **AirSense®** aspirating smoke detectors (and variants)

Kidde AirSense has discovered two firmware issues affecting some of its aspirating smoke detectors that could prevent them from reporting a laser head malfunction and/or result in a gradual loss of sensitivity over time. As these detectors play a key role in critical life safety systems, we are in the process of carrying out a mandatory remediation programme involving our aspirating smoke detectors to resolve these issues.

As part of this remediation programme, aspirating detectors manufactured between January 2001 and December 2012 (inclusive) will require corrective action at the next scheduled maintenance visit.
The date of manufacture is indicated on the product label with the marking DoM, in the format MM/YY.
The pictures below show the AirSense Stratos®, Kidde® Senator™ and FastSense® variants of the product range. There are also other branded versions in the field, including the Ziton® LaserSense™ and Chubb® Atmosfire® detectors (this list is not exhaustive), which look very similar but contain different color and style of marking on the front of the detectors.

Smoke detectors affected by this upgrade

Stratos EX

Stratos Nano

Stratos Micra 25

Stratos Micra 100

FastSense 25

FastSense 100

Kidde Senator Nano

Kidde Senator 25

Kidde Senator 100

Stratos HSSD 2

Stratos HSSD 2 with CM

Stratos HSSD 2 min. display

Kidde Senator 200

Kidde Senator 200 with CM

Kidde Senator 200 min. display

FastSens Plus

FastSens Plus with CM

Fire alarm service and maintenance companies who maintain the affected products should please contact us and we will provide EPROM upgrade kits.
At Kidde AirSense, we pride ourselves on impeccable product quality and strong customer relations.

Please know that we remain committed to uncompromised product excellence – not only at installation time, but throughout our product service life as well. We appreciate your support.
If you have any questions in the meantime, please contact us.

**If you service or maintain any installations where these products are installed, please contact us at:
tel.: +44-1908-281981
e-mail: remediation@kiddeuk.co.uk**

Kidde AirSense

Non-compliance – why near enough must never be good enough

In May of this year a raft of new buildings found to have non-compliant, potentially combustible external cladding were added to the Victorian Building Authority's list as part of its ongoing audit in and around the Melbourne CBD.

Scott Williams
CEO – FPA Australia

In many cases, the audit findings on these buildings read as follows:

"Non-compliant use of cladding material identified and referred to MBS (Municipal Building Surveyor). MBS determined building safe for occupation and no further action required."

As often happens, our Association was approached by news media to provide our thoughts on the new findings and the ever-growing list of buildings identified as non-compliant.

We raised two issues in response to these questions.

First, that there is a need to promote a culture of compliance within the industry, and second, that we must take a holistic look at non-compliance within our new and existing building stock.

Near enough must never be good enough

FPA Australia does not believe that a building being deemed safe to occupy is the same thing as it being compliant.

When asked my opinion on allowing non-compliant buildings to go unrectified, even if deemed safe by a building surveyor, this was my response:

"Allowing non-compliance to remain, even if the building has been declared to be safe, doesn't send the right message to the industry about appropriate professional behaviour."

I also noted that the widespread non-compliance regarding cladding highlighted a basic failure to understand the requirements of the Building Code of Australia (BCA) regarding external walls.

I was surprised by the reaction to this from some stakeholders, including some of our own members.

It is clear that some individuals and businesses believe they should not be held accountable for misinterpreting the BCA, because it was being widely and routinely misinterpreted at the time.

I remain both shocked and alarmed by this.

Certainly our regulations, codes and standards could be clearer and our Association is constantly working to see these improved. However this does not mean industry can ignore minimum statutory responsibilities.

That we have allowed such an open culture of non-compliance to flourish in this industry is not just disappointing; it is dangerous and potentially deadly.

To suggest that because many practitioners interpreted the Code incorrectly somehow constitutes acceptable practice is logical fallacy.

In philosophy this is known as the *Argumentum Ad Populum*, (The Appeal to the Popular). A classic example is that even if the vast majority of people believe that 1+1=3, it is nonetheless false.

Philosophers have understood the absurdity of this argument for thousands of years. In 2016 its about time we faced up to it.

Time for a holistic look at building compliance

In the same Fairfax article I commented that the notably high levels of improperly installed cladding beg the question of what other elements of our buildings might be non-compliant.

If we were so convinced that our interpretation of the Code regarding external walls was correct (when it was in fact fundamentally flawed), what else might we have misinterpreted for decades?

It's time for all of us, both in the fire protection industry and in the building, and construction sectors, to work together in determining what other non-compliances exist in our new and existing buildings and then rectify them.

If issues of regulatory confusion are identified, we must lobby for their clarification, rather than accepting misinterpretation, if we are to ensure the objectives of health, safety and amenity in the built environment are delivered.

Admitting that misinterpretation of the rules has occurred is the first step towards addressing non-compliance, not just in cladding, but across all building components. We must do this and the community expects that we will.

And rest assured, should a catastrophic and deadly fire event occur due to non-compliance, the "appeal to the popular" argument will not protect at-fault industry practitioners from the inevitable consequences.

For more information, go to www.fpaa.com.au

The Confederation of Fire Protection Associations Asia

The Confederation of Fire Protection Associations Asia (CFPA-Asia) and Confederation of Fire Protection Associations International (CFPA-I) met in Melbourne recently, in conjunction with the Fire Australia 2016 Conference.

CFPA-I conducted a board meeting, whilst CFPA-Asia held a General Assembly meeting which included an Industry presentation and general discussion with Affiliate and Associate members.

CFPA-I discussed the Children's Awareness For Fire Prevention Policy Paper and the establishment of a recognition award and international scholarships. The Board decided to reconvene during the NFPA Conference and Expo in Las Vegas in June 2016 to develop a CFPA-I Vision and Strategic plan for presentation at the 2017 General Assembly in 2017.

CFPA-Asia welcomed new members from Cambodia, Bangladesh, Iran and to grant membership to Myanmar and Vietnam on completion of the application forms.

The CFPA-Asia Bylaws were changed to align the frequency of General Assembly meetings and the terms of office for the Office Bearers and Executive to a maximum of four (4) years.

A number of policies/guidelines were endorsed covering recognition of dedicated members, endorsement of Fire Safety Exhibitions, Conferences and Seminars, the use of the CFPA Asia logo on advertising material, websites, brochures and publications and use of CFPA-Asia Logo by Members and Associates. Positions on Maintenance of Fire Safety Systems, Locking of Exit Doors and Single Station Smoke Alarms were extended until 1 December 2018.

A policy on Practitioner Accreditation and Combustible facades was also discussed and work on these policies was deferred.

The meeting also considered a draft of a Co-operation agreement planned to be enacted with a number of research facilities.

A number of delegates also took an opportunity to visit the Victorian fire and emergency services training complex at Craigieburn noth of the city of Melbourne. The facility gives Victorian firefighters access to real life firefighting training scenarios including road, rail, tunnel and marine fires, as well as urban search and rescue.

The next meeting will be held in November during the Shanghai Fire and Security Exhibition.

Image courtesy of CFPA

For more information, go to www.cfpaa.com

Wireless gas monitor from Honeywell

Honeywell, the leader in wirelessly connected safety solutions, today announced the MicroRAE gas monitor, the industry's first wireless four-gas monitor that operates with all major wireless communications protocols – including Bluetooth™, Mesh, GPS, and Wi-Fi. The MicroRAE also can be paired with an intrinsically safe smart phone (available from Honeywell) to transmit gas readings over a cellular network.

"Extending wireless gas monitoring capabilities to include the broadest range of communications platforms in a single device will enable companies with wireless and non-wireless infrastructures to reap the benefits of real-time monitoring and remote safety management," said Thomas Negre, Global Marketing Director, Honeywell Analytics.

For more information, go to www.honeywell.com

pab
PAB Akrapović

When conditions are at their worst,
we are at our best.

THINKING
AHEAD

firefighting series

PAB FIRE COMPACT
EN 443:2008, EN 14458:2004, MED Approved

Designed to protect the head under the most extreme conditions. Optimal relationship between protection and comfort with a broad spectrum of optional upgrades. Structural firefighting has never been safer. Now available worldwide!

PAB Akrapović | Most 26, HR-52420 Buzet, Croatia | info@pab.hr | www.pab.hr

SINCE 1953

Bristol's world class product innovation and development facility expands

Bristol Uniforms' Product Innovation and Development (PID) facility, the nerve centre for all new product development, has expanded its team and moved into a new custom-designed studio.

Bristol's specialist technical designers use the latest Computer Aided Design (CAD) software to create new state-of-the-art product ranges. They have recently welcomed a new designer to their team, and are enjoying a spacious new studio at the heart of Bristol's factory in Staple Hill which dates back to 1899.

The re-furbished space has a contemporary feel whilst celebrating the history and style of the Victorian building. It boasts high vaulted ceilings, exposed original brickwork, and is flooded with natural light from large windows that span the length of the room.

This world-class facility, which has been designing PPE for the emergency services for the last 50 years, is where all of Bristol's cutting-edge product ranges, such as XFlex and LayerFlex, are developed. Bristol's highly-skilled technical designers carry out research into new materials and develop new prototype garments, which are assessed before being sent for external testing and certification. They are also trialled by fire-fighters in the field.

Once trialled, tested and accredited to the appropriate standards, new product ranges are introduced and can be tailored for individual fire and rescue services. Bristol has a growing range of products which means customers can choose from a wide range of styles and fabrics, depending on their requirements. There are infinite combinations available, all of which are compatibility tested to ensure the garments work effectively together and provide full body protection for the fire-fighter.

Roger Startin, Joint Managing Director of Bristol Uniforms said: "Our new PID facility reflects Bristol's up-to-the-minute design and technology capabilities, whilst embracing our legacy and highlighting the distinctive features of this historical building. The interior design was very much a team effort, with our designers involved in every detail from the low energy lighting to the sliding doors to conceal storage space.

"We are very proud of the fact that all our design takes place in-house. Our expert technical team are able to listen to customers' needs and provide innovative tailored PPE solutions. It also means that as a business we have full control of the design process which ensures reliability and continuity for the customer."

Image courtesy of Bristol Uniforms

For more information, go to www.bristoluniforms.com

Zico crowns new king of the fire scene

Jabbing a pike pole or ceiling hook into the drywall often pulls back just shards and scraps. Not the Z-Falcon. Its steel-alloy penetrator head pierces the drywall like a javelin. Once through, the three folding talons expand and lock into place like a grappling hook, pulling back large chunks of debris each time. The result? The job gets done faster and more efficiently than ever before.

The Z-Falcon's handle merges comfort with multi-functionality, adding a 5-1/2" pry and 1-3/4" striking surface to expand its arsenal. The high-quality steel-alloy components are coated in manganese phosphate for maximum rust protection. The heavy-duty fiberglass pole is available in lengths of 48", 54" and 60" with either yellow or orange coloring.

A great choice for home renovation and room demolition too!

Available now. Ask to try one for 30 days of test and evaluation. To view a video demonstration, visit youtube.com/ziamatic.

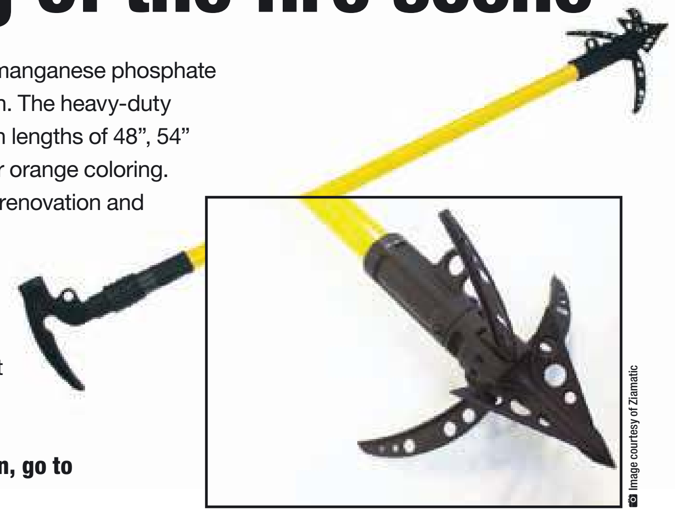
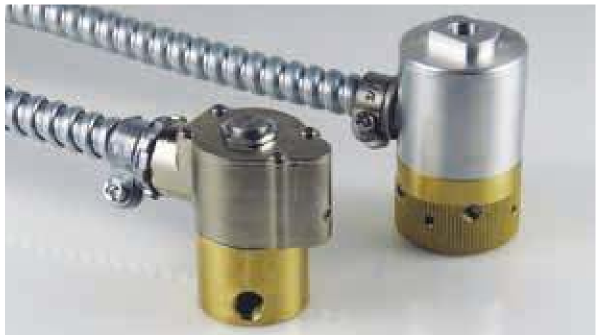


Image courtesy of Ziamatic

For more information, go to www.ziamatic.com

NFPA compliant Direct-Acting solenoid for fire suppression systems



Direct-acting solenoid and pneumatic actuator with integrated supervision.

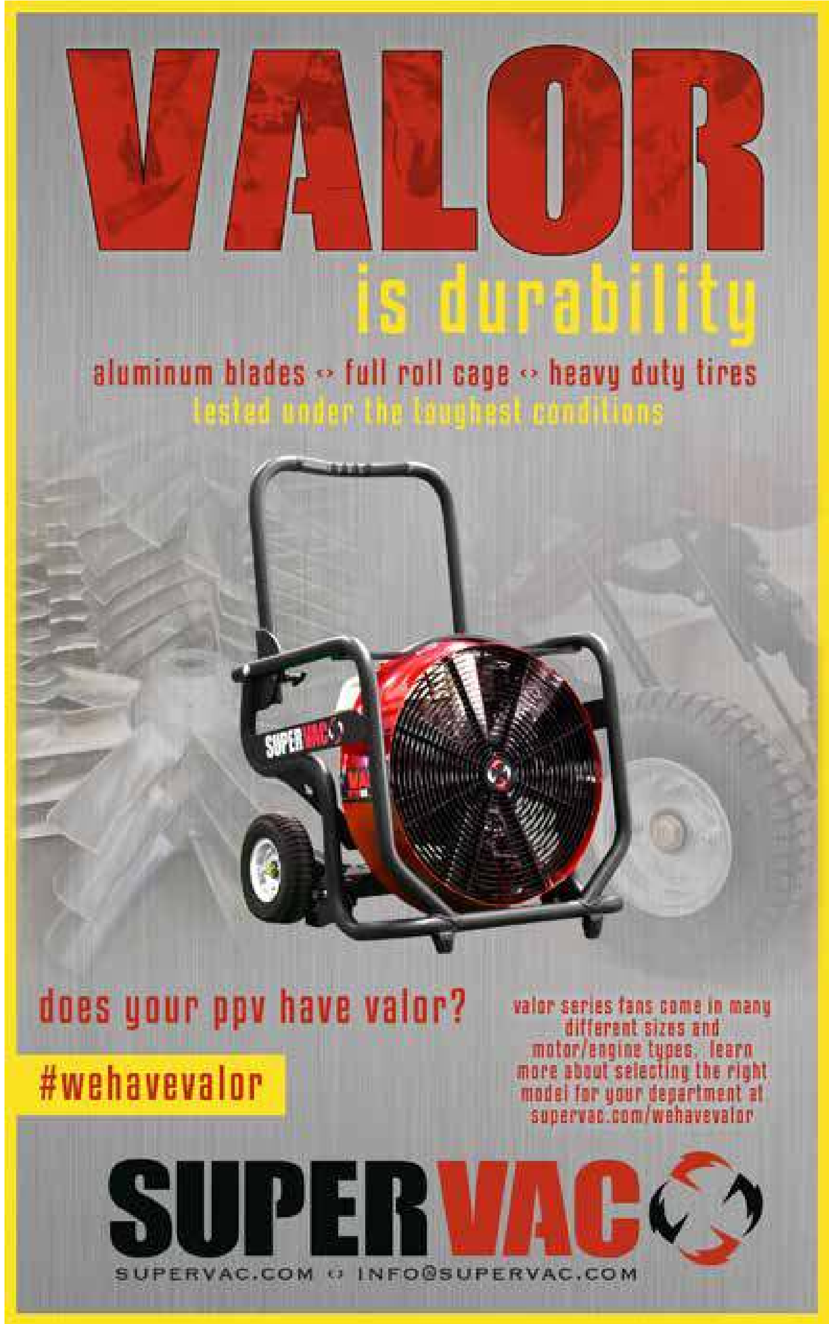
Images courtesy of TLX Technologies

Unveiled at the 2016 NFPA Expo in Las Vegas, TLX Technologies' supervised direct-acting solenoid and pneumatic actuator were well received by the global fire suppression community. As a solution to an industry requirement, TLX Technologies' patent pending design provides a streamlined, NFPA complaint solution for solenoid valves used as pressure vessels on fire suppression systems. This direct-acting solenoid allows for standard removal of the coil for testing with indication that the solenoid has been properly re-installed every time via the integrated supervision feature.

The direct-acting solenoid comes standard with six wire leads. Two of the wires are used for activation and the other four wires are used for supervision of the coil placement and connection to the control panel. Additionally, TLX Technologies has designed this product to comply with all UL and NFPA wiring codes by introducing factory-installed wiring routed through a metal external housing. This housing allows for field selection of flexible metal conduit and conduit connectors that will be required on all UL certified fire suppression systems.

Meeting the requirements of NFPA 2001 (Sec. 4.3.4.1) and UL 864, TLX Technologies' supervised direct-acting solenoid valve allows for user configurability and fully-engaged installation detection. Designed for both clean agent and gaseous systems, this solenoid valve is suitable to meet the needs of your regulatory and system requirements. In addition, it can be modified to operate at various working pressures as needed. For over 15 years, TLX Technologies has worked with manufacturers to develop and manufacture custom actuators and valves to meet the challenging demands of active fire suppression systems.

For more information, go to www.tlxtech.com



VALOR
is durability
aluminum blades ‹› full roll cage ‹› heavy duty tires
tested under the toughest conditions
does your ppv have valor?
#wehavevalor
valor series fans come in many different sizes and motor/engine types. learn more about selecting the right model for your department at supervac.com/wehavevalor
SUPERVAC
SUPERVAC.COM ‹› INFO@SUPERVAC.COM

Panda enclosure protected by FFE

Zoo Negara in Kuala Lumpur has installed FFE's Fireray beam smoke detectors in the panda enclosure and viewing area. The detectors are designed to trigger a smoke spill fan in the event of a fire.

Because of the atrium's high ceiling, conventional smoke detectors were not suitable for this installation," commented Mr K. S. Yau of Prospect Safety Technology Sdn Bhd, the installation company. "A sprinkler system was also not an option due to their slower response times. Beam detectors were therefore best for this installation due to their extremely fast response times," he added.

© Image courtesy of FFE

Beam smoke detectors provide wide-area detection and are used when it is impractical, inappropriate or not cost-effective to use traditional point-type detectors. They are ideally suited to large interiors with high ceilings, such as the panda enclosure, as they enable coverage of a large area at minimal cost.

A particular challenge of this of this application was the possible effects of spotlights and sunlight, which can affect conventional beam detectors by giving false readings. FFE has developed patented light-cancellation technology specifically for this type of installation, however. By actively monitoring ambient light levels on the detector and 'subtracting' them away from the 'real' signal, the Fireray detector can operate under the most difficult light conditions, including bright sunlight.

According to Mr Yau, additional benefits of using FFE's beam detectors include lower costs than alternative detection systems and less time spent on installation and maintenance.

"We are honoured to be selected to supply the beam detectors to the panda enclose at Zoo Negara," commented FFE's managing director Mark Osborne. "We are glad that the visitor attraction sees us as a trusted partner for such an important installation" he added.

By using infrared beams, Fireray beam detectors can identify smoke over much larger areas than traditional fire detection devices, making them perfectly suited for large indoor spaces such as entrance halls, atria, warehouses, sports arenas and aircraft hangars.

For more information, go to www.ffeuk.com

Exova

Testing, calibrating, advising

External Cladding – Fire Testing

Exova Warringtonfire Aus have now added to its portfolio of fire testing in Dandenong Victoria, "Fire Performance of External Cladding Systems" in accordance with BS 8414 Part 1 and 2 2015, adding to our experience with ISO13785 part 1 and 2.

The National Construction Code (NCC) does not provide guidance for testing external wall materials and systems that are combustible. However recently developed standard AS 5113-2016, provides a framework for the classification of external wall systems and refers to test methods BS 8414 Part 1 and 2 2015, ISO 13785-2 and AS 1530.4-2005 Appendix B7.

Exova Warringtonfire Aus is well placed to undertake Fire Testing of External Cladding systems to the test method of your choice.

Call Exova Warringtonfire today for a quotation:

t. +61 (0)3 9767 1000
e. market.pacific@exova.com
w. www.exova.com

AS 5113-2016 Now Published

Coltraco finalist in Seatrade Maritime Safety Awards Asia

Established in 1987, Coltraco Ultrasonics™ is a 3rd generation family company working to deliver Safesite™ & Safeship™ technologies to enhance safety at customer critical infrastructure on land and at sea. We are delighted to announce that we have been shortlisted alongside Fleet Management Limited and Pacific Basin Shipping for the 9th Annual Seatrade Maritime Asia Safety Award. Judged by experienced maritime industry experts, the award comes from the leading global maritime publisher and event organiser as part of their tradition of praising the creative and distinguished work accomplished in the maritime industry. We express our gratitude to Seatrade Maritime Award Asia for recognising our innovation and commitment to improving safety at sea via Portasteele™ Calculator – in tandem with Portalevel® MAX. This enables a ship's crew to calculate the CO2, NOVEC™ 1230, HFC-227ea (FM-200®) mass and weight from its liquid level readings. For the first time, the measurement of contents in a cylinder is delivered through a "Triangle of Clean Agent Monitoring", a system which balances the cylinders' pressure, liquid level and weight/mass for consistent safety. The Portasteele™ Calculator and Portalevel® MAX aim to enhance safety through accurate, reliable and easy to use instrumentation. The Portasteele™ Calculator is based on a 7" tablet computer which is capable of converting liquid level obtained with any Portalevel unit into the exact fill-weight of the agent inside the cylinder. As well as replacing the need for manual calculations and formulas, the Portasteele™ Calculator also has the option to save cylinder sizes and settings, meaning that the device is time efficient and intuitive. Fire safety at sea is a critical issue; it is an area in which we provide simple, ergonomic and reliable solutions designed so that ships can improve on-board fire safety management in accordance with the IMO SOLAS FSS Code Chapter 5 2.1.1.3: "Means shall be provided for the crew to safely check the quantity of the fire extinguishing medium in the containers."

For more information, go to www.coltraco.co.uk

We help suppression system OEMs meet regulatory standards with superior electromagnetic solutions.

Call us with your challenge.

- ULTRA-FAST RESPONSE
- HIGH DURABILITY
- RESETTABLE
- ROTATES FOR EASY INSTALLATION
- UL RECOGNIZED COMPONENTS
- INTEGRATED SUPERVISION FUNCTION
- FULLY ENGAGED INSTALLATION DETECTION
- MEETS UL & NFPA WIRING CODES AND STANDARDS
- ACTIVE MONITORING
- MEETS REQUIREMENTS OF NFPA 2001: SEC. 4.3.4.1
- CUSTOM CONFIGURATION
- AND MORE...

COME VISIT US AT
Intersec 2017
Jan. 22-24, Dubai, UAE
Booth #4-H16

TLX TECHNOLOGIES

CONTACT US:
+1 262-372-2165
www.tlxtech.com

GORE® PARALLON™ System

Ultimate protection without compromise

There is a paradox in firefighter protective clothing that in order to maintain the current high levels of protection from heat and flame, comfort is often compromised. This potentially contributes to heat stress and sub flashover burns in typical firefighting operations

After several years of research, bringing together its technical expertise from around the world, Gore has developed a solution that removes the need to compromise comfort for thermal protection.

The GORE® PARALLON™ System is lightweight, breathable and waterproof delivering high levels of thermal protection in firefighter Personal Protective Equipment (PPE). It reduces the risk of burn injuries and heat stress in wet and dry conditions, creating consistent protection without compromising comfort.

Today's firefighter PPE provides excellent thermal protection from heat and flame, however the wearer has historically still been at risk from steam burns that can occur in sub flashover conditions wearing wet gear. This is the type of injury that is caused by a build up of thermal energy and moisture inside the layers of a garment which causes a burn in sub flash over or by compression, for example when crouching or kneeling or by harness straps of breathing apparatus, integrated rescue systems or belts.

▼ The GORE® PARALLON™ System reduces the risk of burn injuries and heat stress in wet and dry conditions.

Image courtesy of GORE

The GORE® PARALLON™ System has been developed to specifically combat the risks associated with moisture and heat stress by introducing a unique new solution that incorporates a highly breathable Gore thermal barrier combined with a GORE-TEX® or CROSSTECH® Moisture barrier.

This is a unique use of two membranes encapsulating a layer of thermal protection that maintains breathability while wicking moisture away from the skin and out through the suit, simultaneously preventing liquid penetration from the outside.

Internal moisture is efficiently moved through the layers, keeping the thermal protective fabric dry and reducing the risk of steam or wet compression burns. Comfort and breathability is high, reducing the risk of heat stress and keeping the wearer cooler for longer.

In a series of tests comparing other fabrics, the GORE® PARALLON™ System delivered the highest protection from radiant and convective heat, with up to 65% more breathability.

When a fire suit becomes wet inside, whether from water or heavy sweating, protection levels normally drop by 45% with decreased time to burn and less time for escape. In tests undertaken in wet conditions, the GORE® PARALLON™ System consistently maintained thermal protection, allowing more time to escape and reducing the risk of burns.

Firefighters wearing the GORE® PARALLON™ System enjoy peace of mind that comes with:

- Consistently high protection in all conditions – wet or dry
- Protection from radiant heat burns in wet conditions
- High levels of comfort, breathability and freedom of movement from a lightweight garment
- Reduced risk of heat stress
- Weight of garment does not increase significantly in wet conditions (low water pick up)

The GORE® PARALLON™ System has been extensively tested in wearer trials with impressive results. One firefighter said: "The first thing I noticed was the comfort. It was comfortable to wear and easy to move in. Even when it got really hot you only felt the heat very gradually. As soon as you got away from the heat it felt cooler. The cooling effect was immediate. That's a great feature."

The GORE® PARALLON™ System revolutionises firefighter protection, achieving new and more consistent levels of protection and comfort in wet and dry conditions while reducing heat stress and the risk of burns.

For more information, go to www.gore-workwear.com

FIRE & DISASTER ASIA 2016 SINGAPORE
THE 13TH INTERNATIONAL DISASTER, EMERGENCY MANAGEMENT & FIRE PREVENTION TECHNOLOGY & EQUIPMENT EXHIBITION

MARINA BAY SANDS SINGAPORE
28 - 30 SEPTEMBER 2016

WWW.FIREDISASTERASIA.COM.SG

A Part of Architecture & Building Services 2016
Design Support Light Secure Protect

Dedicated to the protection of life and property, Fire & Disaster Asia 2016 will showcase an extensive range of specialised rescue and disaster management equipment, products and associated services.

This year, FDA 2016 will also be held concurrently with five other established exhibitions: ArchXpo, International Facility Management Expo, LED+Light Asia, Safety & Security Asia and Work Safe Asia 2016, creating a comprehensive and integrated platform for all building needs under one roof!

At FDA 2016, you can be sure to meet your key buyers: architects, builders, contractors, developers, engineers, facility managers, fire safety managers & officers and government agencies!

Join FDA 2016 to reach out to your target customers and potential business partners today!

Event Projections
10,000 sqm gross exhibition area
250 exhibitors from 20 countries
9,000 trade professionals from 40 countries

Sales & Sponsorship:
FDA@cems.com.sg or call +65 6278 8666
Media & Advertising:
FDA_publicity@cems.com.sg

Organised By
Conference & Exhibition Management Services Pte Ltd
Supporting Organisations
Fire Safety Managers Association of Singapore
Institution of Fire Engineers Singapore
Concurrent Events
ArchXpo 2016 The 2nd International Exhibition of Architecture & The Built Environment
IFaME
LED+LIGHT ASIA 2016
SAFETY & SECURITY ASIA 2016 SINGAPORE
WORK SAFE ASIA 2016 SINGAPORE

WATERAX

Trusted by wildland firefighters since the 1920's

Wildland portable pumps are an essential tool for firefighting operations, especially in remote environments where water sources are scarce and personnel must travel long distances to hotspots. For nearly 100 years, WATERAX has been dedicated to serving wildland firefighters by being the first to market on several firefighting pump innovations.

The MARK-3® is known as the "heart of the suppression system." Renowned in the Industry, the MARK-3® was first introduced in 1964 when WAJAX (as WATERAX was known back then) coupled their patented 4-stage detachable pump end to a 185cc 2-stroke engine. It quickly became the standard wildland portable fire pump used by forestry agencies around the world. A truly outstanding and reliable performer, the MARK-3® fire pump is designed to withstand the rigors of firefighting and it is the core of most water delivery system in wildland operations.

Applications include attack line firefighting, long hose lay for remote watering during firefighting operations, tandem pumping over long distances and parallel pumping for higher volumes.

Higher pressure pumps are required by wildland firefighters because they face the challenge of fighting fires at great distances and elevation from water sources and have to operate in remote, and often hilly and rugged terrains. Higher pressure units make it possible to move water through longer hose lays and at greater elevation.

They also provide better safety and fire control for the firefighter since higher pressure produces compact and effective water streams that enable longer and higher nozzle reach. The longer reach creates greater distance between the nozzle and the fire, thereby keeping the operator at a safer distance. The greater pressure also provides for better penetration in thick brush and ground debris.

When fires occur in remote areas such as in wildland forests and mountainous areas, the unmatched power-to-weight ratio of a two-stroke engine provides for a powerful yet lighter and more compact unit. This is critical for quick response, quick relocation, and quick movement of the unit without slowing down or tiring a firefighter.

Always the benchmark in terms of performance, reliability and durability, the MARK-3® benefited from a series of improvements to its key components, namely a Nikasil-coated cylinder, an impregnated crankcase and a field maintenance-free pump end.

The MARK-3® has recently successfully passed the USDA Forest Service 100-hour endurance test in San Dimas and has been requalified under QPL-5100-274 as of August 2015. It is considered to be an integral piece of equipment used by wildland firefighters across North America and other countries around the world.

WATERAX acquired the intellectual property and the rights to manufacture the durable 185cc engine from ROTAX. It invested heavily in new tooling and major improvements on key engine components in order to make the 185cc engine even lighter and more durable.

The WATERAX 185cc engine features the following enhancements:

- Nikasil-coated cylinder
- Impregnated crankcase
- Composite cooling fan
- Longer recoil rope

The new Nikasil-coated cylinder is the most significant upgrade on the MARK-3® in years. In addition, WATERAX has adjusted its recommended fuel mix ratio to 50:1 synthetic. Please note that the change to the synthetic 50:1 fuel mix ratio is also valid for older MARK-3® equipped with cast iron sleeve cylinders.

Today, the WATERAX MARK-3® series of high-pressure wildland firefighting pumps is sold and supported by a network of value-added partners in United States, Canada and around the world. There is no doubt the company will continue to innovate fire pumps in order to meet the evolving needs of today's firefighters now and in the future.

▼ MARK-3® Portable High-Pressure Fire Pump.

Image courtesy of WATERAX

For more information, go to www.waterax.com

MARK-3®

The **MARK-3®** is known as the "heart of the suppression system." Renowned in the industry, the **MARK-3®** was first introduced in 1964 when WAJAX (as ***WATERAX*** was known back then) coupled their patented 4-stage detachable pump end to a 185cc 2-stroke engine. It quickly became the standard wildland portable fire pump used by forestry agencies around the world. A truly outstanding and reliable performer, the **MARK-3®** fire pump is designed to withstand the rigors of firefighting and it is the core of most water delivery systems in wildland operations.

The **MARK-3®** successfully passed the USDA Forest Service 100-hour endurance test at San Dimas and requalified under QPL-5100-274 as of August 2015. It is considered to be an essential piece of equipment used by wildland firefighters across North America and around the world.

TRUSTED BY WILDLAND FIREFIGHTERS SINCE THE 1920'S
WATERAX.COM

WATERAX
WE MOVE WATER®

10tanker

FDC-10 tactical use by New South Wales Rural Fire Service

Last December firefighters from New South Wales began using their DC-10 Large Airtanker in a fashion that, while not necessarily an innovation, has not been commonly practiced elsewhere.

Historically airtankers began with the capacity to carry enough retardant to hit a spot, or small section of line, before returning for another load. As the size of airtankers increased, so did the size of the loads they carried, creating the ability to split loads into multiple drops. Todays Next Generation Airtankers carry between 3000 and 11,600 US gallons, but curiously the number of splits on the average mission has remained relatively static. In fact it is safe to say that the majority of airtanker runs made today are either single drop or two drop loads. To be sure it is not uncommon to see a load split into three drops, but anything more is relatively rare.

Now enter a week-long period in late 2015 when 18 DC-10 loads of retardant were dropped on fires in NSW, and those 18 loads were split into more than 60 separate drops. While that average is only 3.3 drops per load, the reality is that many of those loads were split into six, or even seven, drops. Since then, reports indicate the practice continued as the NSW season progressed.

So why the difference, and what does it matter?

The difference, I believe, is both cultural and tactical. Culturally, firefighters in Australia have developed tactics that work well with repeated Sky Crane drops of 2000 gallons, and obviously six drops from a DC-10 fits into those tactics quite well. Tactically, Australian firefighters “build” less indirect line with retardant, and rely instead on tactical application of the suppressant directly on, or close to, the fire line. This tactic usually means shorter runs to follow an uneven line.

The reason this matters comes back to the basic questions of cost efficiency and operational effectiveness. The DC-10, and the amount of retardant it carries, has become regarded as a good example of the benefits of economy of scale. The more suppressant you can carry to the fire line in a single load, the cheaper it becomes. What NSW is showing us is that effective tactical application and economy of scale are not mutually exclusive principles.

For more information, go to www.10tanker.com

▼ **Rural Fire Service DC10 tank configuration.**

Image courtesy of 10tanker

You’re in Good Company
when you specify PBI Max by Safety Components

We’re proud to salute the United States Air National Guard for making the choice to don PBI Max™ outer shells. After purchasing 3,000 sets of turnout gear, USANG joined the growing list of firefighters around the world who trust PBI Max by Safety Components. With over 90,000 sets of PBI Max in service globally, PBI Max has quickly become the most specified PBI fiber solution around the world and the #1 outer shell fabric in North America. Departments and brigades of all sizes can rely on the peace-of-mind protection, mobility, comfort and durability afforded by PBI Max exclusively by Safety Components.

AIR NATIONAL GUARD
SAN FRANCISCO
SÃO PAULO Bilbao
JACKSONVILLE
COLUMBUS
Taiyuan WICHITA
SEATTLE PORTLAND
KANSAS CITY
Pittsburgh TAMPA
TUCSON MOBILE
Philadelphia
DES MOINES Houston
PHOENIX SAN DIEGO
ORANGE COUNTY
HONOLULU Xi’an
Raleigh MONTREAL
Palm Beach County
SHENYANG
BROWARD COUNTY FLA

Pbi MAX™ BY SAFETY COMPONENTS

800.896.6926 EXT. 28 • SAFETYCOMPONENTS.COM

SAFETY COMPONENTS

DuPont™ Kevlar® LEGENDARY PROTECTION

DuPont and Kevlar are trademarks or registered trademarks of DuPont or its affiliates. PBI Max is a trademark of PBI Performance Products, Inc.

Standards Australia

Fire propagation testing and classification of external walls

By increasing community awareness of standards, they can help industry and consumers make informed purchasing decisions. For this reason, Standards Australia works with industry, government and community interests to develop voluntary standards for the building and construction sector through an inclusive and transparent process.

One recent project of relevance in your sector is the development of AS 5113:2016, *Fire propagation testing and classification of external walls of buildings*.

The standard sets out procedures for testing and classification of external walls according to their tendency to limit the spread of fire across their surface and between neighbouring buildings. It can be applied to external vertical surfaces and external wall systems. It does not however apply to the fire resistance or load bearing capacity of external walls.

Mr Paul England, Chair of Standards Australia's fire safety committee said that the publication is expected to improve fire safety by providing a classification method for the fire performance of combustible external walls, making it easier to select appropriate external wall systems.

Mr England further added that "the standard will facilitate quantification of performance in the area of fire safety consistent in with ABCB initiatives".

AS 5113:2016 also integrates international standard test methods where possible. These test methods were selected to ensure consistency with international approaches and the availability and cost effectiveness of testing services in Australia while maintaining the validity and effectiveness of the classification system.

The standard is split into three main sections that set out classification testing, classification procedures and reporting requirements. It also has informative appendices containing guidance information for the application of the standard. These include an example of classification system application to combustible construction and a commentary containing some guidance on the selection of test methods included in the standard.

This standard is the result of considerable effort and dedication on behalf of the FP-018 Technical Committee on Fire Safety and represents a consensus view of industry associations, fire authorities, test laboratories and the ABCB.

At the Building Ministers' Forum in February 2016, Ministers agreed to work cooperatively to implement a range of measures to address safety issues associated with high risk building products. As a part of this initiative, consideration is being given as to how this standard might be used for regulatory purposes.

▼ Industry can now make more informed choices when selecting external wall systems.

Image courtesy of Standards Australia

For more information, go to www.standards.org.au

Enter the World of Fire Prevention

World's leading Trade Fair for Security & Fire Prevention: security essen, 27 – 30 September 2016

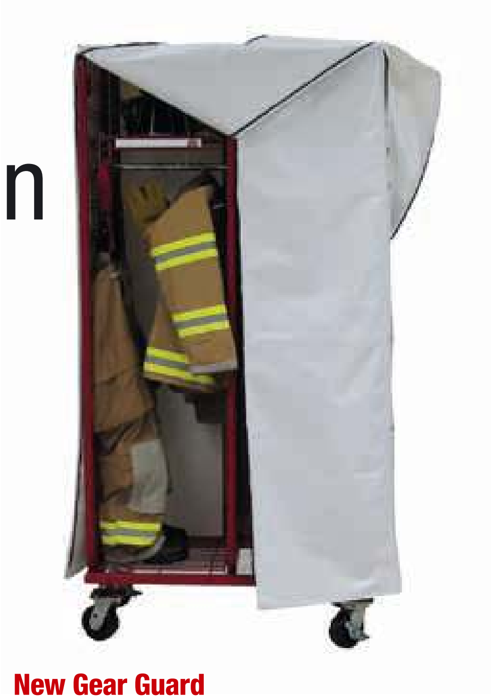
MESSE ESSEN

www.security-essen.de

security essen 2016
THE NUMBER ONE
fire prevention

Ready Rack®

Structurally superior design does not require rear grid



Since Groves Incorporated invented the PPE gear storage system in 1980, we never stopped innovating and improving upon our designs. The key advantage lies in Red Rack™'s structurally superior tubular steel design that does not require a rear reinforcing grid, and therefore will not obstruct electrical outlets and switches. Wall Mounted Red Rack™ systems are available in 18", 20" or 24" wide sections, units are 20" deep and 72" tall. They can be ordered in virtually any wall run length thanks to our exclusive modular design.

Designed for maximum air circulation, Red Rack™ and Dry Kwik accessories help PPE and gear dry faster and last longer. Our system creates maximum organization which helps shave precious extra seconds off your response times; helping you serve your community better!

All Red Rack™ Storage systems include adjustable boot & helmet shelves, hanging pole, adjustable apparel hooks, label holder for name plate and heavy-duty powder coat finish.

Structurally superior design does not require rear grid

- Red Rack™ is designed to stand up to the rugged demands of the Fire Service.
- Tubular steel design is the strongest configuration on the market and does not require a rear grid.
- SAFER! Open back design allows easy access to your station's building code approved electrical outlets.
- Easier to install! Design does not obstruct switches or outlets.
- Maintenance friendly! Clean or paint walls without removing the rack.

Mobile Red Rack™ and Freestanding Red Rack™ units allow you to add additional storage capacity when you do not have the necessary available wall space. Mobile units feature 18" wide sections with single and double sided styles offering 2 – 8 compartments. Units are supplied with four 5" swivel casters, two with foot operated brakes. Freestanding single sided Red Rack™s can connected to create the desired number of compartments. They are supplied with heavy-duty legs, keeping the rack elevated above the floor for easy cleaning underneath.

Any Red Rack™ system can be ordered or retrofitted with lockable security doors and top shelves to prevent loss due to theft.

New Gear Guard

Recent studies conducted by PPE manufacturers have concluded that the lifespan and protective qualities of today's turnout gear can be significantly downgraded by constant exposure to UV rays from sunlight. To combat this problem and protect your Department's investment in PPE, Groves is proud to introduce the NEW Gear Guard protective covers. The New Gear Guard is designed to cover dried PPE while hanging in a Red Rack™ system to prevent UV ray damage and also contamination from truck exhaust. The abrasion and tear PVC resistant covers are available for all Red Rack™ Wall Mounted, Mobile and Free Standing units, with custom sizes available. The easily cleanable laminate is anti-microbial, self-deodorizing and stain resistant.

White 8 oz. PVC laminate UV shield that is abrasion/tear resistant and fluid proof.

- The easily cleanable laminate is anti-microbial, self-deodorizing and stain resistant.
- Laminate also has anti-static properties and is flame retardant.
- Thread is constructed of heavy-duty UV resistant polyester.
- Heavy-duty, long lasting #5 molded plastic zippers aid in the easy opening of the compartment sections.
- Gear Guard covers are available for all Red Rack™ Wall Mounted, Freestanding and Mobile units, with custom sizing available.

For more information, go to www.readyrack.com

▼ **Modular Red Rack™ systems can be ordered in virtually any wall run length.**

We're the Guys You Want to Hang With... After the Call!

STRUCTURALLY SUPERIOR STORAGE SYSTEMS

It's a proven fact that PPE lasts longer when properly cared for. We created the first commercially successful PPE storage system in 1984 and have been developing innovative new products to help you care for your gear ever since. In the Fire Service, you trust your partners, and that's why more firefighters hang with Ready Rack® after the call.

Mobile Red Rack™
*Shown with security option

PPE / Hose Dryer

Freestanding Ready Rack®

GROVES Ready Rack Since 1980 INCORPORATED

We take care of the gear that takes care of you!

www.Pacfire.com.au

www.ReadyRack.com

Pelican™

Intrinsically safe, safety-approved lighting

When working in a hazardous or dangerous environment, it is imperative to use an intrinsically safe, safety-approved lighting tool. Whether working in a Class I oil refinery or in the silo of a Class III textile mill, safety is always a concern. Your light shouldn't add to your worries.

When a light is referred to as 'intrinsically safe', it means that the torch is designed to eliminate the generation of sparks that have enough energy to ignite the surrounding material. Intrinsic safety also protects a light against abnormally high temperatures, meaning that if there was an internal shortage inside the light, the temperature of the components will not rise above the normal operating temperature. In intrinsically safe torches safety measures are put in place to ensure that no component of the torch can reach a temperature that would ignite the hazardous materials in the surrounding atmosphere.

Safety-approved lighting solutions should be specifically suited to the specialized requirements of the fire and emergency services industry and designed to ensure that the highest safety standards are met even in the most hazardous of work environments.

Hazardous locations are identified as areas where fire or explosive threats may exist due to the presence of flammable gases, vapors or liquids, combustible dusts or ignitable fibers. These locations are classified according to the properties of the hazardous materials and the likelihood of flammable concentrations being present. There are different classes and divisions of hazardous materials and environments and safety-approved lights are certified to different levels to meet the varying uses and requirements and users should confirm that the light they intend to use has the correct approval for the area it will be used in.

Torches and lights should betested and approved by the world's leading independent laboratories and undergo a series of rigorous tests to ensure maximum user safety. IECEx is a certification scheme championed by the International Electro-Technical Commission, or 'IEC', and is the preferred certification for the international safety certification of lights used within all hazardous areas.

Some of the safety features of approved torches include:

- O-Ring Seal: Prevents vapors and gases from entering the body of the flashlight and being ignited by a switch spark.
- One-Way Purge Valve: Allows hydrogen to escape from the flashlight's body.
- Hydrogen-Absorbing Pellets in Lamp Modules: A back-up system that absorbs any residual hydrogen retained inside the flashlight. No gas means no spark.
- Battery Polarity Tray: Makes operating a flashlight impossible if one or more batteries are inverted.

The latest light in the Pelican safety approved lighting range is the 3325 LED Helmet torch, a compact, lightweight and waterproof torch designed to fit neatly onto a helmet. The light is equipped with a rear-mounted switch for easy one-handed operation and an optional helmet mount allowing for a hands-free lighting option. The 3325 torch is IECEx certified for use in hazardous environments and emits a bright light of 160 lumens with an exceptional 16 hour run time.

▼ Pelican's latest safety-approved lighting tool, the 3325 helmet light

Image courtesy of Pelican

For more information, go to www.pelicanaustralia.com

Introduction

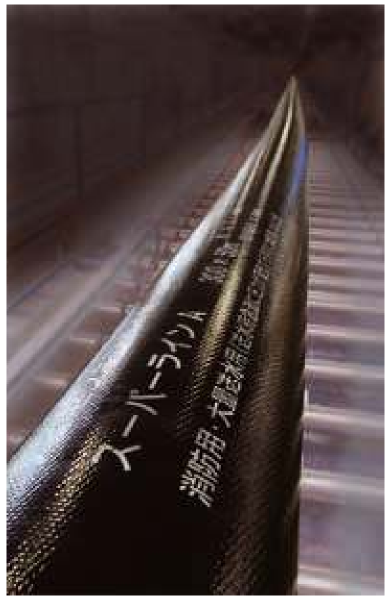
TEISEN produced its first firefighting hose in 1903, and since then, it has been the most experienced and largest firefighting hose manufacturer in Japan.

Super Line Large Diameter Hoses

TEISEN offers the Super Line LDH with a diameter of up to 300mm. Super Line LDH is manufactured using a one-piece construction method, extruding the cover and lining in one step, with polyurethane through a polyester jacket.

Features

●Minimized pressure loss
●Compact storage through a new kind of rubber-like, polyurethane material
●Available in long lengths
●Excellent resistance to heat, fuel, chemicals, UV, ozone, weathering, etc.



Diameter	mm	100	150	200	250	300
	inch	4.0	6.0	8.0	10.0	12.0
Color		orange	orange	orange	black	black
Wall thickness	mm	3.5	3.5	4.0	4.6	5.0
Weight	kg/m	1.1	1.6	2.8	4.0	4.8
Burst pressure	MPa	4.2	4.4	3.6	3.0	2.8
Maximum working pressure	MPa	1.6	1.6	1.4	1.4	1.4
Temperature range	℃	-20℃～50℃				

Teisen
TEIKOKU SEN-I CO., LTD.

7F-Yanagiya-Bild, 1-10, 2-chome, Nihonbashi, Chuo-ku, Tokyo 103-0027, Japan
TEL:（81）3-3281-3031 FAX:（81）3-3274-6397
E-mail: teisen-tyo@teisen.co.jp **URL: http://www.teisen.co.jp**

Frontline Fire & Rescue Equipment

Australia's leading manufacturers of firefighting and specialist Vehicles

Rio Tinto Iron Ore (RTIO) operate numerous mine sites around the thinly populated Pilbara region of Western Australia. These remote mine sites are operated as Fly In/Fly out (FIFO) operations which is a method associated with flying personnel to remote mining operations in Australia for a short period of time instead of permanently relocating the employee and their families. Rio Tinto operate specific key airports to transport personnel to work on this basis.

The largest of these Fly in/Fly out sites is Boolgeeda Airport (YBGD) which has existed albeit originally with a dirt runway – since the 1950`s. In recent years the airport and its facilities have been significantly upgraded with a range of closed charter aircraft including Fokker 100, Boeing 737 and Airbus A320 now flying FIFO personnel direct to the airport from Albany, Perth, Busselton and Geraldton airports on a daily basis

▼ **Originally a dirt runway Boolgeeda Airport has been significantly upgraded to accommodate modern aircraft.**

Image courtesy of Wikimedia

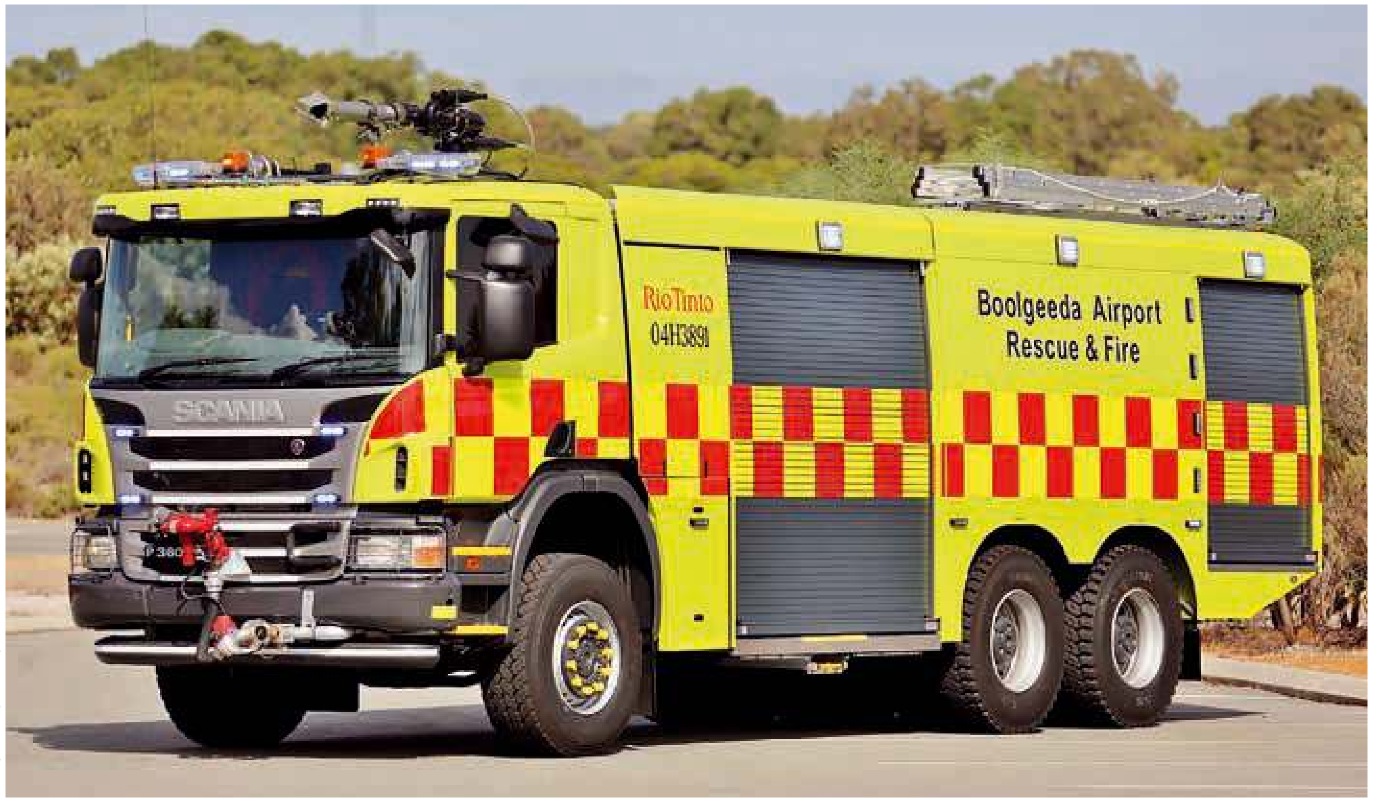
As a private airport operator Rio Tinto are under no obligation to meet International Civil Aviation Organisation (ICAO) regulations. However the company are committed to providing a sustainable duty of care to their employees and therefore provide an appropriate level of fire and crash-rescue cover to oversee aircraft movements at their airport operations. Currently the company is upgrading this level of cover with a project incorporating the refurbishment and re-purposing of some existing vehicles as well as the sourcing of a large ARFF vehicle and three stored pressure CAFS fast response vehicles. In 2014 the company started discussions with Perth based Frontline Fire Rescue Equipment to supply a new airport rescue and fire-fighting vehicle for its Boolgeeda Airport operation as well as the supply of the CAFS fast response vehicles and the refurbishment project.

Frontline Fire & Rescue Equipment established in 2007 are one of Australia's leading manufacturers of fire-fighting and specialist vehicles. From their new state of the art headquarters located in the Malaga district of Perth the company use the latest design technology and manufacturing processes to produce quality, innovative and practical fire appliances finished to the customers exact requirements. The company manufacture vehicles under contract for the Western Australia State Government and custom built vehicles for multi-national mining and oil/gas clients. They offer servicing and maintenance support for existing fire-fighting vehicle fleets and they are currently in the early stages of a 3 year multi-million dollar (A$) contract for the upgrade of 700 fire engines with enhanced crew protection measures including water deluge systems.

Frontline Fire & Rescue Equipment have recently delivered this stunning clean-flowing one-off custom built ARFF vehicle to Rio Tinto Iron Ore for its Boolgeeda Airport operation – the Australian built fire truck considered to be a serious rival to equivalent commercial based ARFF vehicles manufactured by leading international fire-engine manufacturers. Working closely with the customer the company have designed this stunning highly specified aerodrome fire-fighting and crash rescue vehicle from the ground up using the latest computer aided 3-D technology and the expertise of their technical, drafting and engineering teams. RTIO have acknowledged the importance of the local content of this project and the after sales, support and maintenance that can only be provided by a local supplier.

This airport crash tender is based on a special-build Scania P360CB 6x6 HHZ chassis fitted with a 265 kw Euro 5 diesel engine, 12 speed automated manual transmission, an engageable transfer case plus ABS braking. It features a Scania "Day" cab seating a driver and 1 crew with integrated SCBA seating and a modular aluminium body incorporating 4 large lockers enclosed by Centurion roller shutter doors. The rear pump module houses a Waterous CXVT pump delivering 3,800 lpm @ 10 bar which is powered by its own independent Cummins water-cooled diesel engine. The pump module also houses 2 x electric rewind hose reels complete with 60 metre x 25 mm booster hoses and Akron Pistol Grip nozzles; the comprehensive pump control panel, the on-board foam-fill system, various deliveries and the suction inlet.

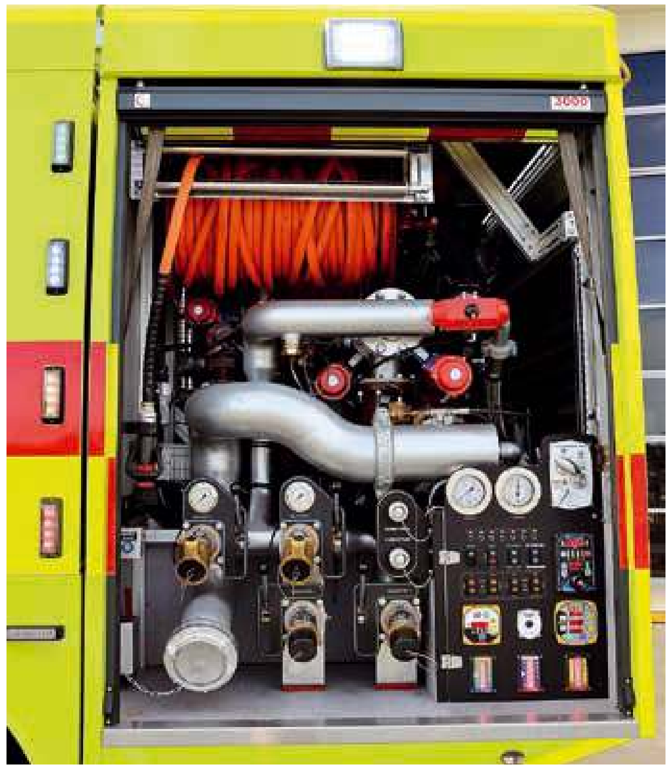
The central tank module consists of a single alloy tank holding 8,000 litres of water, plus 1,000 litres of class "B" Solberg RF6 foam concentrate (linked to a FoamPro Auto-Foam foam proportioning system) and 200 litres of Solberg Fire-Brake concentrate (linked to a FoamPro Turbo-Foam foam proportioning system). The front module houses a skid mounted Perren Engineering 125 kg DCP system c/w hose reel and nozzle to the off-side – plus various stowed fire-fighting and crash-rescue apparatus. The tender makes use of an Akron Trident remote roof mounted monitor c/w manual in-cabin override combined with an Akron Electric foam nozzle delivering 3,000 lpm – plus an Akron Firefox remote bumper turret fitted with an Akron Electric Jet/Fog Master Stream nozzle – delivering 500 lpm. It also has under body foam sprays, a windscreen water spray system and is fitted with Hazard LED lighting to the front, sides, rear and roof of the fire truck.



Images courtesy of Matt Hayes

▲ **A stunning image highlighting the clean lines of the innovative Scania P360 CB6x6 HHZ airport crash tender supplied to Boolgeeda Airport in Western Australia.**

FRONTLINE FIRE
& RESCUE EQUIPMENT



▶ **The rear pump module; showing the Waterous CXVT pump, pump control panel, deliveries and suction inlet plus external tank warning lights.**

This innovative crash tender was manufactured to a very high standard meeting all current ICAO and NFPA standards.

As the vehicle is to be operated by their existing Emergency Services staff, it was a requirement that the vehicle could be deployed and operated by only one person. Whilst its main purpose is to provide fire-cover to the aerodrome, the vehicle has been designed to complement the existing fleet of Mines Emergency Response Vehicles, at other incidents that may occur on the rural site.

For more information, go to www.ffre.com.au

GIS technology improves the workflow of emergency management

Over the last several years, emergency management has become more complicated. Large-scale emergencies seem to be more prevalent, and new threats exist. The need to plan for, prevent, and reduce the consequences of emergencies is greater than ever. Emergency management has the responsibility to collaborate with, coordinate, and facilitate multiple departments in planning, response, and recovery.

Russ Johnson

Russ Johnson has over 30 years of experience in public safety, where he was responsible for planning, preparedness, response, and recovery for large-scale disasters and emergencies. Russ led one of the 18 United States National Incident Management Teams for the Federal Government, responding to very complex disasters throughout the U.S. and internationally. In this capacity, he utilized GIS to manage all aspects of the public safety mission. He helped pioneer the development of standards for the U.S. in the use of GIS for incident management within the Incident Command System.

Geographic information system (GIS) technology effectively improves the workflow in all phases of emergency management:

- Assessment
- Mitigation
- Planning and Analysis
- Response
- Recovery

▼ Understanding earthquake trends including historic locations, plate boundaries and intensity zones can help determine safety problems, set priorities and allocate resources.

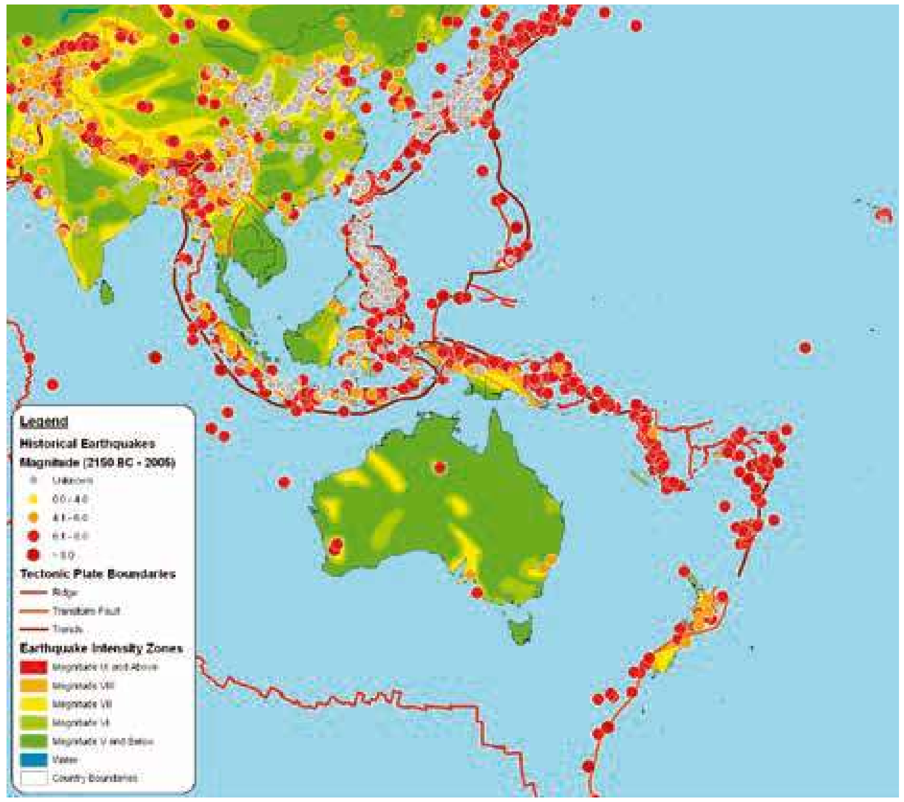


Image courtesy of ESRI

The Esri ArcGIS platform's geographic analytics provide the context for understanding trends, identifying vulnerabilities, and taking action.

Assessment

A geographic context helps to determine safety problems, set priorities, build consensus, allocate resources, and measure progress. Performing risk assessments to identify vulnerabilities and build maps can lead to understanding potential impacts. Using location-based analytics can turn data into information. For example, a predictive modeling tool to determine smoke drift helps keep communities safe.

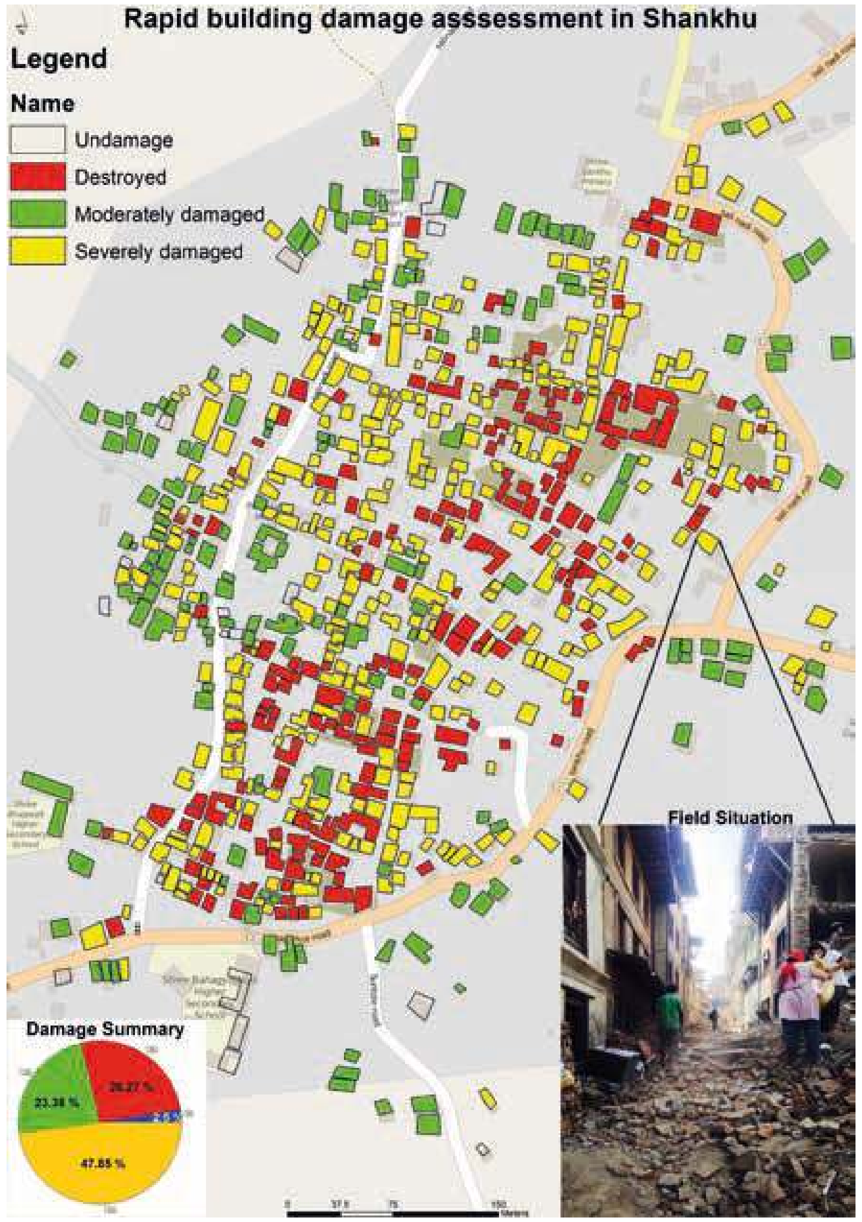


Image courtesy of ESRI

► ArcGIS provides situational awareness when events happen so critical data such as infrastructure, imagery, and hazards are integrated with dynamic event data (sensors, cameras, traffic, incidents, etc.) to represent the current situation.

Mitigation

Mitigation efforts attempt to prevent hazards from developing into disasters altogether or reduce the effects of disasters when they occur. The mitigation phase differs from the other phases because it focuses on long-term measures for reducing or eliminating risk. Successful mitigation is a direct result of comprehensive planning and analysis.

Planning and analysis

Emergency management planning is the process of analyzing a community's hazards, risks, and values to determine its vulnerabilities to natural and manmade disasters. A comprehensive risk and hazard analysis provides the foundation for the development of mitigation, preparedness, response, and recovery plans. Emergency management planning requires acquiring, integrating, and analyzing vast amounts of information and data in a variety of disparate formats to develop a comprehensive risk-based emergency management program.

The ArcGIS platform provides the capability to map and analyze hazards of all types and visualize their potential impacts. When hazards are fused with critical infrastructure, population densities, and other community values, vulnerabilities can be observed, modeled, and better understood. Based on the potential impact of any particular hazard to critical values, priorities for mitigation can be established. Contingency and response plans can also be developed based on important values at risk.

Preparedness

Emergency managers develop plans of action for when disaster strikes. Priorities for action plan development are identified in the planning and analysis process.

To achieve comprehensive preparedness, a great deal of information must be gathered and managed. When disasters strike, the right information must be available at the right place to support emergency decision requirements. GIS, in addition to supporting the preparedness workflow, is a powerful data management system.

Managing data in case of emergency

The ArcGIS platform manages geographic data and disparate documents (plans, photographs, etc.) that are necessary to meet the emergency management mission. GIS provides a capability to access information based on the geographic location to which it pertains, allowing users to get various types of information from the map display. This could include emergency response plans, mitigations plans, and contact lists. The management of resources is essential to support the emergency management mission. Resources include both public safety and civilian resources and their locations, such as fire trucks, emergency vehicles, bulldozers, hardware suppliers, and food and water resources. When these types of assets are inventoried and accessible through GIS, the appropriate resources and their proximity to an emergency can be contacted for timely response.

One of the most complex challenges of incident management is managing the location, status, and capabilities of all of the resources needed to meet incident requirements. Managing resources requires current and accurate data. GIS provides the ability to visualize all types of resources and their current availability and location for effective incident management.

Situational awareness

Situational awareness is being aware of what is happening around you to understand how information, events, and actions will impact your goals and

© Image courtesy of ESRI

◀ ArcGIS allows emergency management teams to respond to incidents and update the public immediately.

objectives both now and in the near future. This is especially important where information flows are high and poor decisions may lead to serious consequences.

In the context of an Emergency Operations Center (EOC), achieving timely situational awareness is essential to maintain an understanding of events, incidents, and developments to anticipate, respond to, and manage actual or potential emergencies. GIS provides situational awareness through a common operating picture. ArcGIS can display relevant GIS data (critical infrastructure, imagery, hazards, etc.) and integrates dynamic event data (sensors, cameras, traffic, incidents, etc.) to represent the current situation throughout the jurisdiction, region, or nation. Comprehensive situational awareness provides the capability for emergency management personnel to make better decisions that can then be quickly displayed, shared, and understood by those who need to take action. The common operating picture can be enhanced when response plans, contingency plans, and other documents are linked to the location or locations for which they were developed. Rapid access to planning information through the common operating picture begins to “operationalize” the planning process.

Response

Emergency management assists in the mobilization of emergency services and resources to support first responders for complex emergencies. This can include specialist rescue teams, logistical support, public safety, volunteers, nongovernmental organizations (NGOs), and others. The Emergency Operations Center is responsible for supporting incident management operation needs and maintains continuity of operations for the community. Acquiring, managing, and maintaining status of resources from various locations is an important function.

Field Operations

Both response and recovery require close coordination and information exchange between the field and EOC. These requirements are often needed under stressful, chaotic conditions, when good information is required to support critical operations. ArcGIS provides the capability for rapid data exchange that is easy to assimilate, understand, and act on. This capability allows EOC to provide elected officials, department heads, and other stakeholders with accurate situation status and data about actual and potential impacts.

Current and timely information is also essential in order to provide the public with information such as shelter locations, evacuation routes, road closures, and hazard areas. Mobile GIS data can be easily integrated into the common operating picture and visualized, shared, and acted on without delay. When the common operating picture is current, better decisions can be made. These capabilities are important during response but can play a very important role during recovery. Using mobile GIS in field recovery operations provides the EOC with a capability to rapidly integrate and display damage impacts from field inspectors in various locations.

Disaster events are increasing, populations are moving into more disaster-prone landscapes, and new threats exist. To meet the demands, professional tools and technology are required. GIS technology can serve a variety of purposes in supporting the workflows and mission of the emergency management profession. Comprehensive emergency management requires coordination and collaboration among many stakeholders – department heads, elected officials, privately held business, the community, and others. The collection of information, analysis of community vulnerabilities, development of mitigation strategies, and overall risk management preparedness is daunting.

When emergencies occur, key stakeholders must share information on the scope of the event and collaborate on the most effective way to manage the incident and maintain government operations. Emergency Operations Centers activate their situation status rooms where various officials meet, share information, and provide their expert input for emergency decision support.

ArcGIS provides a platform for events; their relationship to critical infrastructure can be shared with remote locations, which reduces the need to have everyone in one location. ArcGIS provides a platform for the storage and management of all types of data that can be easily accessed for emergency decision support. The use of GIS technology, namely the ArcGIS platform, is improving how emergency management professionals do their work.

For more information, go to www.esri.com

ONE PLATFORM FOR MULTIPLE OPERATIONS

Esri® ArcGIS® software provides a framework to integrate all types of data, sensors, and activities in real time to understand and share actionable information to make your community safe.

Learn more at esri.com/Safe-APFM

esri®

Copyright © 2016 Esri. All rights reserved.

Marine firefighting with the Hong Kong Fire Services Department

The Hong Kong Fire Services Department (HKFSD) is one of the largest and well trained fire services in the world it is also one of the most diverse protecting its 7.2 million people in all types of emergencies by providing Ambulance, Rescue, Flood, Storm, Fire and Marine services.

Neil Bibby

Hong Kong's 2,754 km2 territories consists of Hong Kong Island, the Kowloon Peninsula, the New Territories and over 260 offshore islands. Of the total area, 1,104 km2 are land and 1,650 km2 are sea. As stated in the Fire Services Ordinance, the duties of Hong Kong Fire Services Department (HKFSD) shall be "to (a) extinguish fires; (b) protect life and property in case of fire or other calamity…" and its powers on occasion of fire cover "any premises, vessel or thing..." Therefore, uncommon to most land based fire brigades in the world, HKFSD has the statutory obligations and a long history of providing emergency service in the marine environment. The commissioning of first "Floating Fire Engine" of Hong Kong Fire Brigade (former name of HKFSD) dated back to 1882. Nowadays, HKFSD has an establishment of over ten thousand well-trained personnel, include 9515 disciplined members and 727 civilian staff. Fire-fighting, rescue and other emergency services are undertaken by three operational Fire Commands and an Ambulance Command. In 2015, they responded to 34,320 fire calls, 33,683 special service calls and 710,041 emergency ambulance calls. This article is to concentrate on HKFSD maritime emergency service for the protection of shipping, the waters around Hong Kong's island, along one of the largest container terminals in the world and around Hong Kong International Airport, a major international and regional hub that deals with 68 million passengers and an average of 1,112 flights a day last year.

▼ Fireboat Elite and Diving Supports Vessel at the Shau Kei Wan typhoon shelter fire September 2015.

Image courtesy of HKFSD

Neil Bibby is the editor of *Asia Pacific Fire* magazine.

History

Hong Kong has a long history as seafaring center going back many centuries but we will look at the 1950s to now. The establishment of Marine Division in HKFSD was formalized in early 1960s although fireboats had been part of the emergency response well before. A milestone in the development of fireboat fleet was 1953 when Fireboat Alexander Grantham (AG) went into service. She served as the flagship of HKFSD fireboat fleet, responding to fire alarms and conducting rescue operations both inside the territories and outside Hong Kong waters, if warranted. Fireboat AG built by Hong Kong & Whampoa Dock Co. Ltd. was the largest fireboat in Asia before being decommissioned in 2002. She was an enduring witness to the history of Hong Kong's sea rescue services and her role was taken over by Fireboat Elite upon replacement.

Marine Firefighting and Rescue Today

Currently, the Marine Division is equipped with eight fireboats, a diving support vessel and two diving support speedboats. These vessels are operated by the complement of fireboat crews formed by 200 professional firefighters. After transferring from land side fire stations, new fireboat crews receive on-the-job training for more extensive marine firefighting knowledge and skills. With the accumulation of sea time, achievement of local marine certifications and passing internal assessments, they will progress step-by-step along either the deck or engineering stream in Marine Division and become the specialists on board fireboats, responsible for the safe navigation and operation of the vessels. At the same time, the crews maintain firefighting and rescue as their core duties. Fireboat crews can take up emergency tasks independently or jointly with other land crews. On the major fireboats with diving facilities, there are also qualified rescue divers posted on board who perform multi-task duties on surface as well as underwater. Furthermore, there are two Command Boats and eight speedboats under the Airport Fire Contingent, dedicated for the safety of aviation transport moving around the international airport.

Underwater Search and Rescue

The Diving Unit under Marine Division has 120 active divers responsible for aquatic search and rescue down to the maximum depth of 42m. The Unit also operates a 3-compartment compression chamber for treating patients requiring hyperbaric oxygen therapy. The FSD Diving Base on Stonecutters Island is an operational cum training facility equipped with a range of professional systems like a deep dive simulator able to simulate 100m water depth for wet dive training and an 8m deep pool where high waves and strong helicopter downwash can be generated to replicate common rescue situation in open water. A modular shipwreck is also placed in the pool to test the divers' sense of orientation and their maneuverability in confined space. Besides serving the objective of diver training, about 4000 members of the fire and ambulance stream have already completed swift water awareness training in the swift water pool of the Diving Base. In 2015, a Special Rescue Team has been formed in Diving Unit to meet the challenges of rescue work at the subsea tunnel construction project near Hong Kong International Airport. A part of the tunnel will be pressurized above 5 bars during construction and this team adopts mixed gas diving mode to cope with the potential rescue scenario inside the tunnel.

Image courtesy of HKFSD

▲ New Fire and Ambulance Services Academy, Aquatic Incident Training Area.

Aviation Emergency at Sea

As the airport is surrounded by sea, Airport Fire Contingent of HKFSD provides rescue and firefighting for aircraft accidents within 5km of the water surrounding the airport. Two high-speed catamaran Command Boats (CB) and 8 high-powered speed boats are deployed at the Sea Rescue Berths located strategically at the eastern and western ends of the airport. Each 35.6m long CB has a rescue capacity for 600 persons, well prepared for any untoward incident of the largest passenger aircraft in this Category 10 airport. Besides equipped with fire-fighting system, infra-red night vision system, side-scan sonar and remotely operated vehicle, the CB is built with a helicopter winching platform and two rescue zones along the beams with low freeboard to facilitate convenient casualties handling and transfer. These two CB are manned 24-hr and they form the core of emergency operation at sea. In case of an aircraft ditching, both CB will be turned out immediately from the Sea Rescue Berths, and the speed boats will be operated by personnel from the two airside fire stations who will steer the speed boats to scene for rescue and firefighting operations.

Notable Incidents

There had been a number of catastrophic maritime incidents that posed great challenges to HKFSD. The following major incidents are spotlighted in the timeline.

In the Sunday morning on 9 Jan 1972, RMS Queen Elizabeth, the largest ship in the world when it launched in 1938, was anchored in Hong Kong's Victoria Harbour. She was there to be converted to a floating school called "Seawise University". A series of fires suddenly broke out aboard, forcing hundreds of visiting shipyard workers to evacuate the ship. John A. Hudson,

Image courtesy of HKFSD

Fireboat Elite has taken over from the Fireboat Alexander Grantham as the pride of the fleet.

an Englishman who witnessed the fire described "… What had started as puffs of smoke from portholes turned into a raging inferno in the upper superstructure generating huge volumes of smoke. This, over only a three hour period." Fireboats tried to extinguish the fire for the next 24 hours. The ship still burning, finally keeled over and sunk.

In the National Day holiday on 1 Oct 2012, two passenger vessels namely "Lamma IV" and "Sea Smooth" collided off the northwest coast of Lamma Island. "Lamma IV" carried 124 passengers and 3 crewmen on board. Most of them were staff of a power company and their families. They were taking an excursion trip from Lamma Island to Victoria Harbour for viewing the firework display celebrating the National Day. Before the firework display was about to start, the two vessels both making way crashed. The commuter ferry "Sea Smooth" was damaged but managed to return to port safely. "Lamma IV" sank quickly at a dramatic angle to the horizontal and threw all passengers into the water. They had difficulty not only in retrieving lifejackets but also in donning them properly. The attachment of the seats on the upper deck failed, caused both seats and passengers to be thrown down so that they slid towards the stern of the cabin where some passengers were hurt and trapped, some were then drowned. In the subsequent 86 hours, Hong Kong Maritime Rescue Coordination Centre coordinated all available search and rescue units at scene (including Fire Services vessels and Marine Police launches). Six fire boat and four speedboats together with more than 350 fire and ambulance crews engaged in this incident for search and rescue on sea surface and underwater. Survivors who had been struggling inside the cabin of sunken vessel and around the crash location were rescued. Divers had to retrieve the bodies of deceased persons whom were found entangled in and trapped by seating in the cabins of "Lamma IV". A total of 39 persons on "Lamma IV" lost their lives and 88 injured. This was the city's deadliest maritime accident in 40 years.

On 27 Sept 2015, many vessels returned to Shau Kei Wan Typhoon Shelter and closely moored during the traditional Mid-Autumn Festival. About 2pm, a fire broke out on a fishing boat in the typhoon shelter. Upon receiving the fire call, fire appliances from nearby stations were turned out and arrived in 6 minutes. The fire crews approached the burning vessels on Marine Police Launches with their firefighting equipment. Owing to strong wind and multiple explosions of LPG cylinders on the affected vessels, fire spread rapidly to other fishing boats and pleasure crafts which predominately built with glass fibers or wood. Some burning wrecks also drifted freely, endangering nearby vessels. Fireboat Elite and Diving Support Vessel were the first batch of fireboats arrived at scene and battled with the blaze. Ultimately, the huge fire was extinguished using 8 water monitors and 9 jets. A total of 29 vessels were damaged and 5 persons sustained slight injuries.

Training and Development

Fireboat officers are sent abroad periodically to keep abreast of modern fire-fighting technology and broaden their fleet management knowledge through interactions with overseas counterparts. Starting 2015, an attachment programme has been launched with Nanhai Rescue Bureau (NRB). Participants live on board NRB rescue vessels in the 4 weeks to observe and take part in the daily operation for learning practical skills about vessel control, rescue and salvage in the open marine environment.

New Initiatives

Modernization of the fireboat fleet is on-going to cope with the development of the seafront facilities and to ensure the provision of high quality maritime emergency service. The aged Fireboat 7 is going to be replaced and the new vessel will have higher cruising speed of 40 knots and enhanced features on chemical, biological, radioactive and nuclear protection. In order to improve quick response capability, Rescue Jet Bike (special design rescue water bike) will be introduced to the fireboat fleet this year for coastal snatch rescue and assisting mass rescue operation.

To meet the demands for growing size and complexity of emergency services in Hong Kong, the new Fire and Ambulance Services Academy (FASA) has been officially opened on 29 Apr 2016. With the large scale 5-deck ship fire simulator and 90m long swift water channel around the ship model in FASA, different levels of marine firefighting and rescue training in realistic settings can be imparted to the marine fire crews specifically and to all emergency responders at large.

Summary

It should now be very clear to the readers that the Marine Division is a well-equipped, extremely professional part of the HKFSD protecting the shipping traffic, ferries, leisure craft, the airport, islands, wharfs and those that work in this busy marine environment.

For more information, go to www.hkfsd.gov.hk

TEXAS A&M ENGINEERING
TEEX
EXTENSION SERVICE

The International
Fire & Emergency Training Leader
TEEX trains emergency response personnel from more than 45 countries each year!

Choose from over 130 courses including:

- Firefighting
- Emergency Medical Services
- Fire Investigator
- Fire Officer / Instructor
- Hazardous Materials Response
- Rescue / Urban Search & Rescue
- Industrial Emergency Response
- Marine / Oil Spill Response
- LNG Emergency Response
- NIMS / ICS
- Annual Spanish School
- Latin American Emergency Response
- Leadership

Each course can be tailored to meet your exact needs in a variety of areas

Schedule your classes and
Experience the HEAT!

C13.6627.02

1-866-878-8900 www.teex.org/fire

New!

DUAL AIR CYLINDER BRACKET

Models DCAB-5 & DCAB-6

- Accommodates dual cylinder SCBA & SCUBA with or without a harness
- Thermoplastic, non-mar, high-cycle clips can be adjusted along heavy-duty aluminum extrusions to secure a wide range of cylinder sizes
- Easily mounted to virtually any flat surface

Zico
ZIAMATIC CORP

1-800-711-FIRE | ziamatic.com

Our employees fight fire and so do our products

*My name is Magnus.
I am working with product development at Fomtec.
This picture is from a fire test in Sweden. Follow us if you want to find out more about me, the Fomtec way and all our products.*

Follow us
Twitter @ fomtec
Facebook Dafo Fomtec AB
Webpage www.fomtec.com

fomtec
Fire Fighting Foams & Equipment

Environmental selection and use of firefighting foams

The fire protection industry has concerns with the Queensland Department of Environment and Heritage Protection's draft policy on firefighting foams, and calls for modifications.

Brett Staines

Firefighting foam is a suppression agent used for controlling and extinguishing fires involving flammable liquids.

Recently there has been an increased focus on environmental effects from using firefighting foam, often without due consideration for other important issues such as firefighting performance, firefighter safety and system compatibility.

The Queensland Department of Environment and Heritage Protection (DEHP) has released a draft policy on the use of firefighting foams. While its intention to improve environmental outcomes is to be praised, the policy has several serious shortcomings that not only undermine the aim of reducing environmental effects but would also have adverse effects on safety for firefighters, personnel in hazardous industries and the community in general.

It's hoped that by way of this article the concerns the fire protection industry has with the draft policy will be more widely appreciated and will lead to the draft policy being modified so that improvements to both environmental and fire safety outcomes can be achieved.

Points of agreement

FPA Australia agrees with several parts of the DEHP draft policy:

- All firefighting foams have adverse environmental impacts.
- Foam containing the surfactant PFOS should be banned and existing stocks removed from service and destroyed.
- All foam and fire water effluent should be managed in an environmentally **responsible manner.**
- End users should transition from fluorinated foams containing perfluorooctanoate (PFOA) and carbon chain length C ≥ 8 (over a suitable transition period).

FPA Australia notes that existing fluorinated foams containing PFOA are being reformulated to eliminate PFOA and these will soon become available.

FPA Australia's concerns

While some common ground exists, FPA Australia has serious concerns with parts of the DEHP approach. In particular, FPA Australia believes that promoting selection decisions based only on the environmental properties of firefighting foam concentrate is a flawed approach.

Firefighting performance is equally important in determining the environmental outcomes for an incident (e.g. duration, toxic combustion products and volume of fire water effluent produced), as well as business continuity and safety of firefighters, hazardous facilities and the community in general. Choosing the best firefighting foam for an application must, first and foremost, be based on selecting the best product to protect people, property and the environment. This requires selection based on a balance of firefighting performance, reliability and life safety, with minimal toxicological and environmental effects. As a general guide the Association recommends the following criteria be used for firefighting foam selection:

- firefighting performance
- life safety
- physical properties and suitability for use on known hazards
- compatibility with system design and approvals
- environmental considerations.

Although environmental performance is important, failure to adequately consider the firefighting and system performance aspects may result in selection of a foam that is ineffective for extinguishing fires.

This can lead to greater environmental impact resulting in longer extinguishment times, use of larger quantities of foam and

Brett Stains is Technical Development Manager, Fire & Security Products, Australasia, UTC. FPA Australia TAC 11/22 Chair and Australian Standards Special Hazards Committee Chair.

Image courtesy of FPA Australia

▲ **FireFighting Foam in use in an emergency spill situation.**

water and the production of significantly greater quantities of firewater effluent, which requires disposal.

Firefighting foam is part of a system Evidence of suitability (certification) must be provided to demonstrate any foam's ability to achieve the required firefighting performance for the fuel in question, following appropriate and recognised testing. Evidence of suitability must also be used to demonstrate that the foam is compatible with associated systems and equipment. It is not always possible to change the type of foam used in a system without having to make significant modifications to the system. For example, many foams have high viscosity and may not be able to be correctly proportioned using existing hardware in systems where low-viscosity foams were previously used. Any proposal to change the type of foam used in a system requires careful consideration and must take fire safety and engineering factors into account.

The type of foam used should not be changed without completing a detailed review of the design, performance and operation of the system as a whole. Such design reviews should include consultation with fire system designers, foam and foam hardware suppliers and the relevant authority.

No such thing as environmentally friendly foam

Let's be clear – there is no such thing as environmentally friendly foam. All firefighting foams have adverse effects on the environment. However, it must also be recognised that fires – especially those involving flammable liquids and other chemicals – also have significant adverse environmental effects in their own right. It is a general objective to extinguish a fire as quickly as possible.

In achieving this objective there is a positive effect in terms of minimising risk to life safety, property, the environment and business interruption. Specifically, using the minimum possible quantity of foam and water to control or extinguish the fire is greatly beneficial because it reduces the environmental impact by reducing the amount of fire water effluent to be managed post incident. Good firefighting performance is critical to good environmental outcomes. Therefore, firefighting performance cannot be ignored when making selection decisions aimed at minimising environmental impact. Poor firefighting performance is worse for the environment because of:

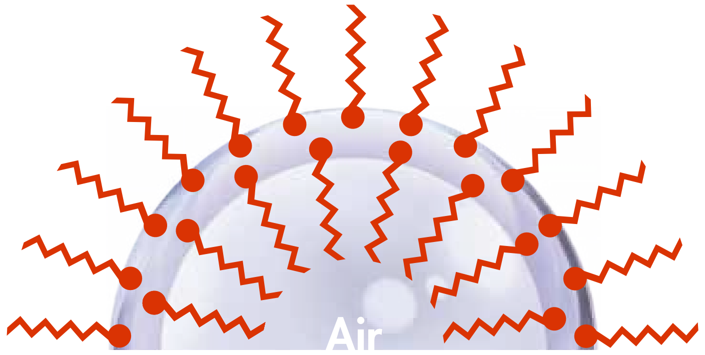
- longer extinguishment times – risk of escalation, more toxic combustion products, risk to life, property and business continuity
- use of larger quantities of foam and water – more toxic and contaminated effluent
- life safety concerns – e.g. slow knockdown, poor flashback resistance, unreliable post-fire securement and risk of escalation.

Not all foams are equal

Firefighting foams have different firefighting performance. Effective firefighting foams must:

- be compatible with the foam proportioning and delivery equipment
- cool the fuel surface
- protect from re-ignition

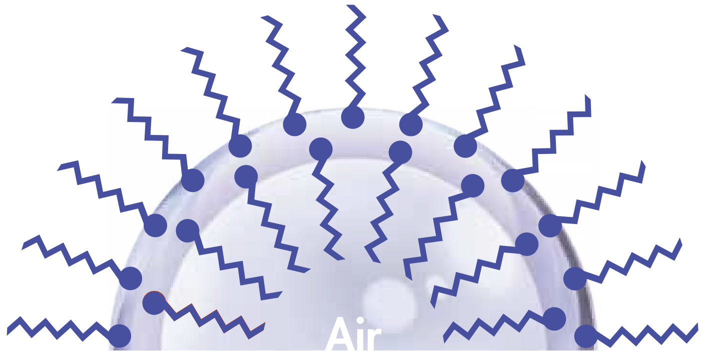
Fatal Attraction



Fluorine-free foam bubble
F3 Foam **attracts** hydrocarbon fuels
Hydrocarbon surfactant
(Hydrocarbon tails are fuel-loving)

FORCEFUL F3 APPLICATION:
- Foam attracts fuel
- Foam becomes flammable
- Foam has reduced performance
- Foam use is increased

Need proof? See F3 foams on fire:



Fluorinated foam bubble
AFFF Foam **repels** hydrocarbon fuels
Fluorosurfactant
(Fluorocarbon tails are fuel-hating)

FORCEFUL AFFF APPLICATION:
- Foam repels fuel
- Foam is NOT flammable
- Foam has superior performance
- Foam use is reduced

One year ahead of the US EPA 2010 / 2015 PFOA Stewardship Program deadline, Dynax only manufactures high purity C6 Fluorosurfactants, Foam Stabilizers and optimized High Performance Blends meeting the toughest fire performance specifications (including Mil F) at traditional / reduced Fluorine Levels.

DYNAX CORPORATION
PO Box 285, Pound Ridge, NY 10576 USA
T 914 764 0202 techinfo@dynaxcorp.com
F 914 764 0553 www.dynaxcorp.com

dynax
FLUOROCHEMICALS

Image courtesy of FPA Australia

▲ **FPA Australia wants to see a holistic approach to the risks associated with the use of firefighting foams to fight fires in hazardous facilities.**

- resist attack or breakdown by the fuels (in particular, polar solvents)
- resist mixing with the fuel
- spread rapidly over the fuel surface
- Suppress the release of flammable vapours.

Significantly, firefighting foams containing fluorinated surfactants have valuable firefighting performance characteristics that historically have been unmatched by F3. These performance advantages, which include improved firefighter safety and increased firefighting effectiveness (vapour suppression, knockdown and burnback), can significantly reduce the amount of foam required to control an incident and limit damage to the environment and risk to life and property.

That said, some F3 foams have recently achieved compliance with Australian Standards for use in portable fire extinguishers and pre-engineered systems, and development continues to improve F3 performance.

Less post-fire effluent

Better firefighting performance means less post-fire effluent. These performance differences are not limited to small-scale fire tests. An incident at Caltex's Banksmeadow terminal in Sydney in July 2013 provides a real-world example of the significant performance difference between F3 and fluorinated foams. Foam was used for vapour suppression and to prevent ignition of a large 175,000-litre fuel spill. When using fluorine-free foam (F3), effective vapour suppression (maintaining vapour levels below the fuel's lower explosive limit) was only achieved for 15–20 minutes before foam needed to be re-applied. However, when fluoroprotein foam was later used, vapour suppression was achieved for 90 minutes.

This example demonstrates that use of fluorinated foam provided significantly longer protection and reduced frequency of re-application at that time. It also serves to demonstrate that using a foam with superior firefighting performance can significantly reduce the amount of foam and fire water effluent that needs to be managed post incident.

No silver bullet

Fluorine-free foams do not provide a 'silver bullet' solution to environmental problems associated with the use of firefighting foam. As demonstrated above, using F3 in some fire incidents could require significantly larger quantities – three or more times the amount – of both foam and water to manage an incident because the firefighting performance is inferior to fluorinated foams.

Increased risk

Poor firefighting performance equals increased risk. The draft policy incorrectly implies that the total risk resulting from an incident, up to the point the incident is controlled, will be the same regardless of the type of firefighting foam used. That is, the draft policy assumes that the firefighting performance of all foams at a given incident will be equal. As illustrated in Figure 2, this is not the case.

Hazardous facility managers need the flexibility to use risk management principles to select the most appropriate foam to manage the particular risks. The risk management for these facilities must be considered holistically, from pre to post incident, and not be based solely on the environmental properties of the concentrate.

Contamination and using F3

Using F3 doesn't eliminate existing contamination. The Queensland DEHP draft policy incorrectly assumes that if F3 has been used at an incident there will be no contamination with fluorinated compounds in the firewater effluent. Changing to F3 does not eliminate long-chain fluorinated compound contamination in facilities that have previously used fluorinated compounds. Long-chain fluorinated compounds can be present many years after changing to F3. The experience at AirServices Australia sites demonstrates this situation.

AirServices Australia sites changed to F3 five years ago; however, soil and groundwater at these sites is still contaminated by PFOS. As a result, FPA Australia believes all firewater effluent should be considered to be contaminated and that it be contained and tested before determining the appropriate method of treatment and disposal, regardless of the type of foam used.

Proper management of firewater effluent is important to minimise adverse environmental effects. FPA Australia believes environmental policies should focus on stipulating how the firewater effluent from an incident should be managed irrespective of the type of firefighting foam used. The mantra for the management of all firewater effluent should be – contain, test, treat.

Risk must be managed holistically

The environmental risks resulting from fires in hazardous facilities must be managed holistically. Environmental regulators must acknowledge that different foam technologies have different firefighting performance characteristics and these can significantly affect the environmental outcome of an incident.

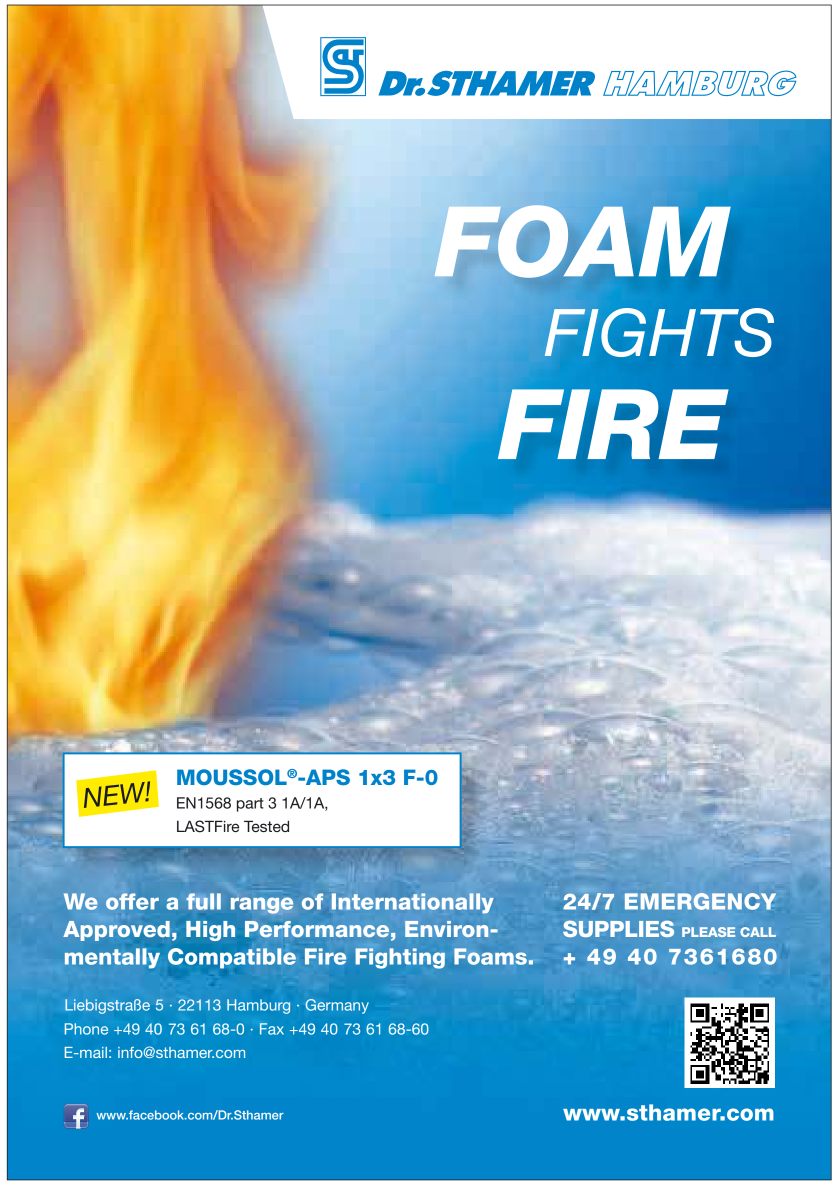
FPA Australia believes that foam users must be allowed to select the foam to best manage their risk and endorses the approach to selection and use adopted by the UK Environmental Protection Agency. It allows emergency services and hazardous facility managers to select and use the most appropriate foam concentrate to best manage their risk (putting out the fire as quickly and efficiently as possible – fewer combustion products, increased safety, less foam and water usage and less effluent to manage afterwards).

We recommend that Australian regulators adopt a similar approach. FPA Australia believes broad industry consultation is required to address the concerns of this draft policy. Regulators must engage in open, meaningful and transparent discussion to ensure any proposed policy and its effects are fully considered and are compatible with life safety objectives in the first instance. Regulators must not base post-fire effluent treatment decisions purely on the type of foam concentrate used. All firewater effluent must be treated as contaminated with long-chain fluoro chemicals regardless of the type of foam used (unless on-site testing proves otherwise).

The draft policy's proposed restrictions on the use of C6 fluorotelomers are unnecessary. The restrictions would effectively prohibit their use despite these new-generation fluorinated foams, produced in accordance with the US EPA Stewardship Program. C6 foams are a legitimate and environmentally acceptable option alongside fluorine-free foam and should therefore attract similar conditions for use to those prescribed for fluorine-free foams. There is no precedent either within Australia or in any other country for such onerous restrictions on the use of C6 fluorotelomers.

Finally, industry must be allowed sufficient time to transition from existing foam stocks of C8 (non-PFOS) to either US EPA-approved C6 formulations or F3 as appropriate to the particular facility or application.

For more information, go to www.fpaa.com.au



NEW! MOUSSOL®-APS 1x3 F-0
EN1568 part 3 1A/1A,
LASTFire Tested

We offer a full range of Internationally Approved, High Performance, Environmentally Compatible Fire Fighting Foams.

24/7 EMERGENCY SUPPLIES PLEASE CALL
+ 49 40 7361680

Liebigstraße 5 · 22113 Hamburg · Germany
Phone +49 40 73 61 68-0 · Fax +49 40 73 61 68-60
E-mail: info@sthamer.com

www.facebook.com/Dr.Sthamer

www.sthamer.com

"NEXT GENERATION TECHNOLOGY"

Cutters Edge®
FIRE RESCUE SAWS

- X-Torq® Engine Technology Equals More Power... More Torque ... Better Fuel Efficiency
- 75% Less Emissions

Visit us at FDIC
Indianapolis, Indiana
April 18th - 23rd Booth #1508

The new Dual-Air X-Torq® intake engine technology significantly improves overall cutting performance and meets all Air Quality Control standards at the same time.

MULTI-CUT® Fire Rescue Saw

New 2100 Series includes two engine sizes: 70.7cc and 87.9cc. Each engine is designed for use with Cutters Edge Carbide Tipped BULLET Chain® to cut the widest range of materials found at fireground and rescue scenes

CE94 Concrete Cutting Rescue Chainsaw

A new technology 94cc engine and a new style Diamond chain cuts reinforced concrete up to 16-inches thick. Features a lighter weight power head and full-wrap handle for high performance concrete cutting in any position.

MULTI-CUT® H Series Rotary Rescue Saw

New H Series is engineered and powered to work harder and operate longer in the most extreme fire and rescue conditions anywhere. The new technology engine is available in three sizes: 74cc, 94cc and 119cc. The Cutters Edge Black Star and Black Diamond Blades offer long cutting life and high speed cutting of virtually all materials.

BULLETBLADE®

What sets the BULLETBLADE® apart is that it can be sharpened and repaired. The new carbide-tipped BULLETBLADE® will cut any material any other carbide-tipped blade can cut … and more!

International Contact:
Tel: +1 541 524-9999 FAX: +1 541 524 9996
Email: info@cuttersedge.com
www.cuttersedge.com

Understanding future fire danger

The risks of climate change were thrown into sharp relief this recent summer for Australia's most southern state, Tasmania. A reduction in hydro-electric generation capacity due to dwindling dam storages was compounded by a failure of the main cable connecting Tasmania to the national grid. As power shortages loomed, the state's major industrials were ramping down production to avoid brown outs.

Dr Tom Remenyi

Dr Rebecca Harris

Dr Harris and Dr Remenyi are members of the Climate Futures research group at the Antarctic Climate & Ecosystems CRC in Hobart, Tasmania. The team works with a wide variety of industry and government end-users to translate regional climate projections into practical, fit-for-use research products.

To contact the authors, please visit acecrc.org.au/people/

Meanwhile, in the famed UNESCO World Heritage Area, an unprecedented dry winter and spring had primed the region with dry fuel. Fire-sensitive sphagnum and alpine ecosystems had dried out so extensively that these usually damp, wet ecosystems were transformed into tinder. Ignition came from the skies above, where an abnormally unstable atmosphere sparked more than 2000 lightning strikes over a single day.

It was a testimony to the work of emergency services that no lives or property were lost. The main losses were to areas of sensitive alpine ecology, parts of which had not seen a major fire in hundreds, or possibly thousands, of years.

This damage included extensive peat fields in the west, which had dried out so much they became hydrophobic. When it did finally rain, the ground remained dry and fires continued to burn underground. Anecdotal evidence suggests these underground fires resurfaced more than once to create new fire fronts.

About 120-thousand hectares – or roughly 1.3 per cent – of Tasmania's World Heritage Area was impacted by more than 300 fires. The fire season ended with a record 15 total fire ban days state-wide, five more than any previous year.

Forest fires are an emotive issue in Australia. Wildfire events, particularly those involving the loss of life or property, are usually followed by impassioned debate over the best approaches to fire safety and management. Such discussions often prompt calls for policy interventions,

▼ Scorched areas near Lake Mackenzie at an altitude of about 1200 metres, after lightning strikes triggered fires on January 13.

© Image courtesy of Rob Blakers

◀ About 120-thousand hectares within Tasmania's World Heritage Area were damaged by wildfires in early 2016.

from increased fuel reduction burning to planning law changes that prevent new housing construction in high risk areas. Amidst these debates, the most important information for future planning has been largely out of reach. A lack of credible data about likely future pressure points, in particular how critical fire thresholds for safety and management may change in coming decades due to climate change, has been a major stumbling block for emergency management.

Only weeks before the first fires in Tasmania's World Heritage Area started, one of the nation's leading climate research agencies based in Hobart released the findings of a pioneering analysis of the state's future fire danger. The findings could not have been more relevant or timely. The analysis projects that, under the IPCC's high future emissions scenario, Tasmania can expect roughly double the fire danger over twice the area of land by the end of this century – including in the World Heritage Area.

The study, led by Dr Paul Fox Hughes at the Hobart-based Antarctic Climate and Ecosystems Cooperative Research Centre, is the highest-resolution, long-term climate modelling study of future fire risk produced in Australia. The projections indicate a continued, steady increase in fire danger throughout the century, as well as a longer and more intense fire season throughout most of the state. Most importantly for those who manage fire risk on the ground, the report provides granular detail on which geographical areas are likely to become future pressure points. The report finds:

- The type of strong weather system that brings the majority of the worst fire weather days to south–east Tasmania is projected to become more frequent.
- The total number of days per year categorised as 'Very High Fire Danger' is projected to increase by at least 120%. This represents about a 10% per decade increase to 2100, and will not stop there.
- Projected changes show strong regional and seasonal variations. Regions currently with the greatest risk of fire are projected to get worse most rapidly.
- The area of Tasmania under 'Total Fire Ban' conditions during summer due to fire weather is projected to increase by at least 75%. This is a 6% increase per decade.
- The average area of Tasmania in spring categorised as 'Very High Fire Danger' is projected to increase by at least 250%. This is a 20% increase per decade.
- There is no major change to the fire danger risk in autumn, except in parts of the Derwent Valley.
- The analysis suggests that all projections could be conservative estimates of future changes.

▼ Cushion plants in Tasmania's Central Plateau damaged by fire.

Images courtesy of Rob Blakers

MCH-6/EM
DRIVEN BY:
SINGLE-PHASE ELECTRIC MOTOR
CHARGING RATE:
100 L/min 6 m³/h
DIMENSIONS:
HEIGHT 35 cm
WIDTH 65 cm
DEPTH 39 cm
DRY WEIGHT: 39,5 Kg

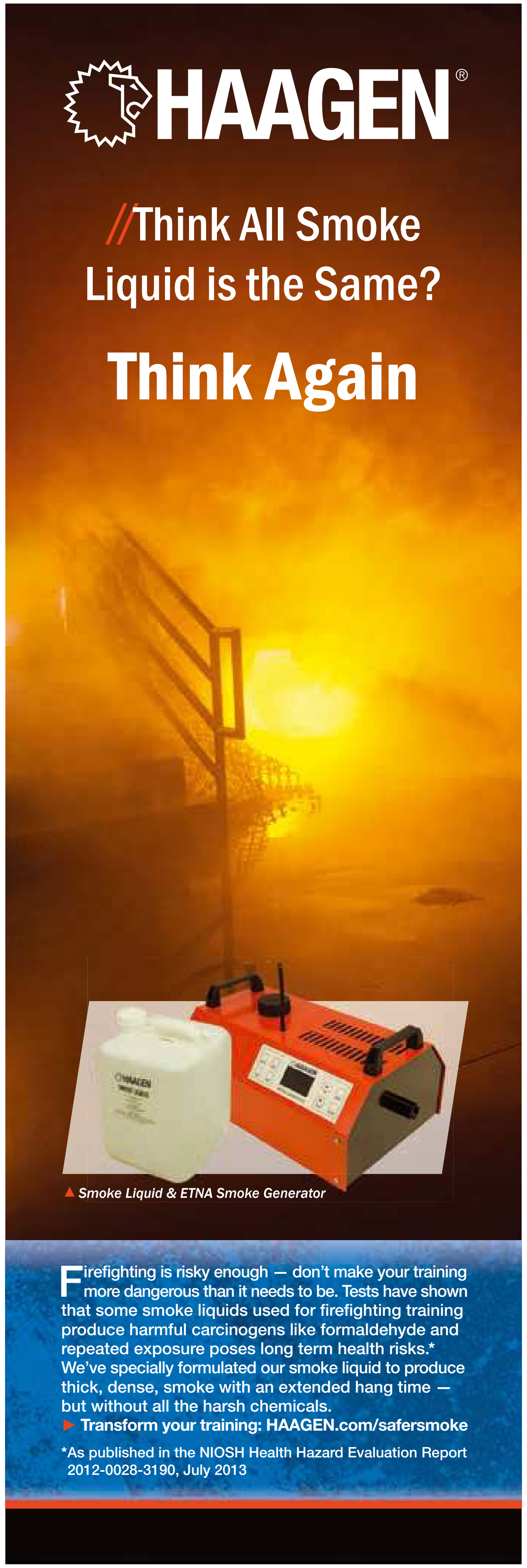
MCH 16 ET COMPACT
DRIVEN BY:
THREE-PHASE ELECTRIC MOTOR
CHARGING RATE:
315 L/min 19 m³/h
DIMENSIONS:
HEIGHT 88 cm
WIDTH 92 cm
DEPTH 61 cm
DRY WEIGHT: 187 Kg

MCH 16 ET STANDARD
DRIVEN BY:
THREE-PHASE ELECTRIC MOTOR
CHARGING RATE:
315 L/min 19 m³/h
DIMENSIONS:
HEIGHT 63 cm
WIDTH 83 cm
DEPTH 43 cm
DRY WEIGHT: 100 Kg / 220.4 lbs

COLTRI ASIA PACIFIC
MADE IN ITALY

COLTRI ASIA PACIFIC Co., Ltd.
Free Zone at 304 Industrial Park 2 No. 94/5, Moo. 3, T. Khao Hin Sorn,
A .Phanomsarakarm, Chachoengsao 24120 Thailand
Tel: + 6638855103 to 5 Fax: + 6638855106
www.aerotecnicacoltriasiapacific.com

AEROTECNICA COLTRI® S.p.A.
via dei Colli Storic i 177 5010 San Martino della Battaglia Brescia - ITALY
Tel: +39.030.99.103.01 +39.030.99.102.97 Fax: +39.030.99.10.283
www.aerotecnicacoltri.it



HAAGEN®

▲ Smoke Liquid & ETNA Smoke Generator

Firefighting is risky enough — don't make your training more dangerous than it needs to be. Tests have shown that some smoke liquids used for firefighting training produce harmful carcinogens like formaldehyde and repeated exposure poses long term health risks.* We've specially formulated our smoke liquid to produce thick, dense, smoke with an extended hang time — but without all the harsh chemicals.
▶ Transform your training: HAAGEN.com/safersmoke

*As published in the NIOSH Health Hazard Evaluation Report 2012-0028-3190, July 2013

Image courtesy of iStockphoto

▲ **Tasmania can expect roughly double the fire danger over twice the area of land by the end of this century.**

The main output of the research comes in the form of daily values for the McArthur Forest Fire Danger Index, recorded every day between 1961 to 2100 at a resolution of 10 km by 10 km. The well-known McArthur index, which combines rainfall, evaporation, wind speed, temperature and humidity, is designed to provide a rough guide to the chance of a fire starting, as well as its rate of spread, intensity and difficulty of suppression.

The team's analysis draws on a large and valuable future climate dataset previously produced for the ACE CRC's Climate Futures for Tasmania project. The project which received funding from the State Government's Climate Change Office between 2008 and 2011, provided long term climate projections aimed at assisting local decision makers and industry with climate change adaptation and planning. Using a method known as 'dynamical downscaling', the Climate Futures team was able to 'enhance' the resolution of global climate models to produce very fine scale projections that can be applied at the local level. Similar to enhancing a low resolution photograph, the process turned a single grid cell for the entire island into a grid of more than 3,000 useful locations at 10km resolution

Dynamical downscaling introduces the influence of mountains on atmospheric systems, such that the effect of rain-shadows, mountain peaks or valleys, or south facing slopes can be better represented over long time scales. Over a topographically varied region like Tasmania, the dynamical downscaling was able to capture high levels of detail about climatic variability across space and time. The sheer computing power required for the task was considerable, taking approximately 1200 days of continuous computer time on a 0.82 teraflop supercomputer to produce in excess of 75 terabytes of data. The project was arguably the highest value piece of research in this space in Australia to date, providing products that have since been used in more than 100 other projects, including this more recent assessment of fire risk.

The Future Fire Danger project represents an important step forward in our ability to forecast future scenarios, but like all models, it is imperfect. Considerable work is still needed to capture the future risk for different management zones, such as municipalities, biogeographic regions, public reserves and parks. Accurately representing fuel availability and soil dryness remains a challenge, including the transition into hydrophobic conditions in normally wet, alpine terrains observed over the summer.

Follow up discussions between the ACE CRC's research team and operational personnel have already identified a number of potential operational impacts. Fire and emergency services personnel must manage a wide variety of complex challenges, and it is clear that these demands will continue to increase in the future. A core challenge for the emergency management sector is that factors driving both increased environmental and social vulnerabilities are changing.

Agencies such as emergency services, utility providers, park managers and forestry companies often experience significant increases in resourcing pressures during high fire danger days. Fire services may be required to roster additional personnel, or an electrical infrastructure manager may require manual inspection of faults instead of relying on automated systems. These increased demands tend to reduce the number of days available for maintaining day-to-day service levels, and increase the risk to personnel in the field. As the number of total fire ban days is projected to increase, so too will the workforce required to achieve the same day-to-day tasks within limited time. As rural communities continue to experience a decrease in available firefighting volunteers, the location of infrastructure and resources and the management of those resources will need to evolve.

These insights are helping to underpin new research by the ACE CRC team, who have extended their focus to the likely future interactions between climate change and demographic change – and the implications for emergency management. High-resolution climate modelling is helping to provide the team with improved estimates on the likely magnitude and location of capacity gaps, as well as opportunities for alternative management strategies. Another current project building on the outcomes of this work is an investigation into prescribed burning as a future management tool under a changing climate. The team is investigating how the conditions suitable for prescribed burning will change into the future, flipping the focus of the management question being address from response to mitigation.

Business leaders throughout Australia have recognised the somewhat distant impacts of 'climate change' are no longer so distant, as new challenges emerge into their business horizons. Strategic decisions must increasingly incorporate and manage climate risk, especially as the finance and insurance sectors embrace similar approaches.

Tasmania's policy makers are applying such an approach to the problems presented by changing future bushfire risk. In March, the Tasmanian Government appointed ACE CRC Adjunct Dr Tony Press to head a new project to examine the impact of climate change and strengthen wilderness fire-fighting techniques in Tasmania. The Government has asked for a “warts and all examination” of the day-by-day management of bushfires in Tasmania to improve future management. Major research-gaps already identified include the likelihood of dry-lightning events into the future, development projectable fuel load indices, improved fire behaviour modelling to assist operational response. Incorporation of climate change within this project is only possible with the existence of high-quality, validated, high-resolution climate model output and the associated expert analysts to conduct the studies, all of which Tasmania has been investing in for many years.

Images courtesy of iStockphoto

▲ **The report provides fine scale detail on areas likely to become future pressure points for bushfire.**

▶ **The annual number of high fire danger days in Tasmania is projected to increase during this century.**

Successfully transforming fundamental climate science into useful, usable tools for policy makers, practitioners and strategic decision makers has been developed, proven and matured in Tasmania. This framework and methodology is now ready to be rolled out across the country. Existing, generic climate tools are ready to be applied over new regions, whilst regional, specific solutions for are waiting to be developed. Through a national, collaborative approach, the research capability developed in Tasmania could be expanded and shared throughout the country to ensure the implications of climate change are considered wherever possible, promoting resilient and robust decision pathways whatever the future holds.

For more information, go to acecrc.org.au

AFAC16 powered by INTERSCHUTZ

Where the emergency management sector innovates

Under the theme Getting the Balance Right: Mitigation – Response – Recovery the AFAC16 program, co-produced with the Bushfire and Natural Hazards CRC, has been launched.

The premier emergency management conference in Australasia, AFAC16 powered by INTERSCHUTZ will explore how those responsible for emergency management are getting the balance right, within new, diverse, inclusive multi-agency disaster management services. Held over four action-packed days from August 30 to September 2 at the Brisbane Convention and Exhibition Centre, AFAC16 will attract delegates and visitors from emergency and security services agencies, all levels of government, non-government organisations, research and education institutions from Australia and world-wide.

Due to increasing pressure on resources from record-breaking temperatures and severe weather, emergency management agencies need to innovate to ensure all communities are protected from the threat of natural disasters.

Australia is a hazard-prone country, but to reduce the economic impact, social disruption and trauma arising from an increase in natural disasters, there is a strong need for emergency service agencies to think long term about the costs and benefits of risk mitigation and prevention.

The current economic costs of bushfires alone in Australia, according to last year's trajectory, will reach $337 million per year. But this isn't purely an Asia-Pacific issue. Globally, bushfires have increased by 19%, with 350 million hectares being burnt each year (an area roughly comparable to that of India, according to the Climate Council's report – The Burning Issue: Climate Change and the Australian Bushfire Threat).

Combining the wisdom of experience, research and analysis from across the emergency management sector, AFAC16 is the largest and most important public safety event in Australasia.

Images courtesy of AFAC

"For more than 23 years, the AFAC conference has provided the Australasian emergency management sector a platform to learn from the best national and international experts – we are pleased to outline the AFAC16 program which we believe will continue to develop our collective knowledge," states AFAC CEO Stuart Ellis. Bringing the worlds best to one place to broaden our collective knowledge, AFAC16 will help educate emergency managers to face their challenges.

"Each year emergency managers face the challenges of natural hazards. Many communities are adversely affected by severe weather events – cyclones in the north, storms along our coasts, floods on our plains, and fires in our hills," Bushfire and Natural Hazards CRC CEO Dr Richard Thornton said.

The full program is available at www.afacconference.com.au/program.

For the first time, the AFAC conference will be powered by INTERSCHUTZ following a partnership between AFAC and Hannover Fairs Australia, and as a result, will bring to Brisbane latest technologies and equipment from around the globe.

Both the conference program, and the growing trade exhibition, position AFAC16 as both the premier and the most comprehensive emergency management conference in Australasia.

The program features high profile Australasian and international speakers that will explore the biggest challenges facing the emergency management sector. Speakers have been selected to ensure the program features presentations relevant to everyone within the emergency management sector.

Keynote presenter Chief Rhoda Mae Kerr will explore '*The future state of fire services – change is inevitable*' from the International Association of Fire Chiefs Board of Directors, and President and Chair of the Board, Austin Fire Department. Chief Kerr will bring her international expertise to Brisbane.

Images courtesy of AFAC

Dr Anthony Bergin, Deputy Director, Australian Strategic Policy Institute will present on how '*Prevention is better than cure: why mitigation is critical to building a resilient nation*' will focus on the best ways to ensure risk can be minimised through proper preparation and prevention.

Prof Gavin Smith, Director, Department of Homeland Security Coastal Resilience Center of Excellence, University of North Carolina, will provide insights into public sector involvement with his presentation '*The role of state government in disaster recovery: lessons from research and practice in the United States*'.

In addition to the three days of conference, there will also be Post Conference Development Workshops & Field Trips on Friday 2 September.

As in previous years, the Bushfire and Natural Hazards CRC Research Forum will begin the week, showcasing the latest in natural hazards science from around Australia and the world. With more than 30 researchers, the Research Forum is not just for scientists – it is a great opportunity to engage directly with researchers on key industry issues.

This year the Women and Firefighting Australasia (WAFA) conference will be co-located with AFAC16, concentrating on the need for diversity and equity in fire and emergency services.

The AFAC16 powered by INTERSCHUTZ Trade Exhibition has attracted over 32 international companies from 13 countries – over 130 companies in total, with 40 first-time exhibitors. There will be new technology, products and services that you may not have ever seen, or brands not previously showcased to the Australian fire, emergency services and first responder industries.

Come and see the;

- MAGIRUS TAF20 on display
- A life size helicopter
- Thermal technology
- Drone technology
- Major BRT manufacturers, suppliers and body builders
- Decontamination services
- PPE manufacturers
- Emergency lighting
- Protective burnover unit
- Solar de-energising solutions
- Time management, deployment and incident tracking software
- And so, so much more!

In conjunction with and held within the Trade Exhibition will be an exciting program of case studies and educational sessions being designed and presented on the Expo Stage, showcasing next generation mobile intelligence, commercial partnering to keep pace with disruptive technologies, and many more.

For more information, go to www.afacconference.com.au

10 Tanker Air Carrier

Booth 105

In 2006 10 Tanker Air Carrier introduced a new asset to the Wildland Fire Industry in the form of a DC-10 wide-body jet, setting new standards for capacity, speed, safety and cost effectiveness. Given these attributes, fire managers recognized the tremendous efficiencies the DC-10 brings to the mission, and how this single tool can keep fires smaller and less destructive for both the general public and the ecosystem.

The performance of the DC-10 allows for retardant loads three to four times larger than other Next Generation air tankers. By bringing four times more retardant to the fire line on every flight, fires are extinguished more quickly, lowering risk exposure for both pilots and ground personnel. At the same time, these efficiencies reduce the cost per gallon delivered by up to 65%, which is an important figure for budget conscious fire managers. For firefighters on the ground, the effectiveness of the DC-10 represents a significant innovation in aerial fire suppression.

10 Tanker DC-10s have operated on wildfires across the United States, Canada and Australia. They have dropped retardant in every type of terrain ranging from the Mountains of the Sierra Nevada to the plains of Texas, everywhere finding high praise for the dramatic effectiveness of these modified and fully certified aircraft.

Now with three aircraft flying, 10 Tanker Air Carrier continues to enhance what is already the safest, most effective airtanker available, and plans to expand its scope of operation to serve firefighters around the globe.

www.10tanker.com

ACCUFIRE

Booth 247

ACCUFIRE manufacture small, utility mounted fire lighters. These enable farm, forest and rangeland managers the capability to efficiently ignite large tracts of target flammable vegetation quickly, safely and remotely from the cabin of a utility vehicle.

The origins of ACCUFIRE is from broadacre agriculture.

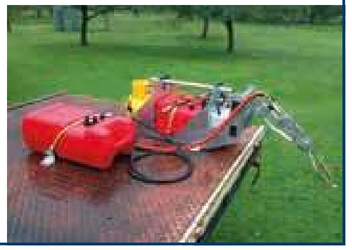
There is a concerted move within Australian agriculture to effectively control the developing menace of herbicide resistant weed seeds. In all the grainbelt regions, resistant weed seeds are mechanically collected with existing farm equipment at grain harvest time. Weed seeds, grain stubble and chaff material is channelled into a windrow, then burnt in a controlled manner using the Accufire Broadacre Firelighter to effectively kill off the target weed seeds.

Further enhancement of this firelighter has enabled ACCUFIRE to offer a firelighter unit for forest and rangeland managers for hazard reduction applications.

Used by land managers whose focus is on routine hazard reduction burning of flammable forest vegetation and rangeland grass vegetation. Accufire can introduce the operator to comfort, speed and efficiency with:

- In cab switch control for fire on/ fire off
- "Quick tatch" to utility dropside or to lighters own frame mount
- "Obstacle flick past" spring loaded swingarm
- Ambidextrous as it can function on either side of the utility
- Angle of flame throw is adjustable for speed or cast distance
- Operates in forward and reverse
- Auxiliary long range fuel tank capacity as standard
- Fuel and gas efficient
- Hands free stress free

www.accufire.com.au



Akron Brass Company

Booth 102-103

Customers have trusted Akron Brass as a manufacturer of fire-fighting equipment since 1918. Akron Brass has built its reputation on providing durable nozzles, monitors and valves. We hold ourselves accountable to the highest quality standards today. We continue to innovate in our core water-flow products, while expanding in LED lighting and electronic control systems for the fire service. For nearly 100 years, Akron Brass has been dedicated to the service of our communities by making them safer through the creation of durable, quality products.

Because we know that people count on our products to help protect property and save lives, we're committed to having the best products in our market. Every product is 100% tested for water tight integrity and performance. All of our products are individually cared for by our product experts, who lead development, seek customer feedback and strive for innovation to create better products for the future. Our extensive product portfolio means you will see Akron Brass products from bumper to pumper.

At Akron Brass, our business is driven by our customers. The challenges you face inspire us to solve problems, to laser-focus on quality craftsmanship and to push for innovation. Our priority is to create the products you trust in defense of life – yours, your department, and the communities you serve. You may have never visited our facility here in Wooster, OH, but you are a part of us. We are proud to work alongside you, creating a working relationship based on quality and trust.

www.akronbrass.com

EFFECTIVE & FRIENDLY.
IT'S NOT AN OXYMORON.

SEE US AT AFAC
Booth #79
Aug.30 - Sep.01, 2016

Solberg RE-HEALING™ Foam not only provides the performance you are accustomed to with current firefighting foams, and rely on, it's also safe for your firefighters and the environment. RE-HEALING Foam has superior vapor suppression and longer drain time for better burn-back resistance. The first true fluorosurfactant and fluoropolymer-free foam, there are no environmental concerns for persistence, bioaccumulation, or toxic breakdown.

Learn more about RE-HEALING Foam and 1%, 3%, 6%, 3x3% and 3x6% ATC™ concentrates available at **solbergfoam.com**

UL, ULC, FM, EN, IMO, ICAO
Product certifications vary dependent upon concentration type.

RE-HEALING™ FOAM
AUTHENTIC FLUORO-FREE

THE SOLBERG COMPANY
1520 Brookfield Avenue
Green Bay, WI 54313
USA
Tel: +1 920 593 9445

SOLBERG SCANDINAVIAN AS
Radøyvegen 721 - Olsvollstranda
N-5938 Sæbøvågen
Norway
Tel: +47 56 34 97 00

SOLBERG ASIA PACIFIC PTY LTD
3 Charles Street
St. Marys NSW 2760
Australia
Tel: +61 2 9673 5300

AWG Fittings GmbH

Booth 182/187

AWG Fittings GmbH is one of the world's leading manufacturers of mobile and stationary fire protection systems. As a complete provider of fire-fighting fittings, fire protection systems and hydraulic rescue equipment, we supply fire services, industry and other users with advanced and innovative products on every continent in the world.

With the expertise and extensive experience we have gained over many decades, we are now able to make a significant contribution to greater efficiency and efficacy in rescue and fire-fighting operations. What's more, we are very good listeners! Constant and direct contact with the people who use AWG products promotes continuous development on our part.

Our aim is to protect and preserve lives and property. We must work hard at improving our products every day if we are to fulfil this lofty ambition. We know that rescue teams in every country greatly appreciate the high standard of quality of our products. And we see it as our responsibility to ensure that this continues to be the case. State-of-the-art technology, easy and intuitive handling, robust reliability and always resource-efficient: these are the consistent features of modern fire-fighting and rescue systems from AWG Fittings GmbH.

All products are made with the utmost care by highly trained workers at the Ballendorf facility (Baden-Wurttemberg). The comprehensive testing of individual components is one of the main quality guidelines designed to ensure that products consistently meet the highest specifications for use in rescue operations.

www.awg-fittings.com

Bluemont PTY Ltd

Booth 215

10 years ago Hytrans mobile water supply units successfully extinguished the massive Buncefield Oil Depot fire in the UK.

- 13 Hytrans units were deployed by fire brigades
- It took only 1 hour to deploy 33,000 metres of large diameter hose
- It took just 8 hours to recovery 33,000 metres of hose.

Too often firefighters cannot fight fires efficiently because of a lack of water. The open water source, such as creek, sea or lake, may be too low for a suction pump; a hydrant may be too far away or not supply enough water. The fire fighter needs lots of water for warehouse fires, tip fires and tyre fires as well as fires at major hazard facilities or fires at remote locations.

The mobile Hytrans firefighting system can set up a water supply system over 1 kilometre in 20 minutes, delivering up to 8,000 litres per minute continuous water supply.

Because Hytrans uses hydraulic submersible pumps it can pump water from depths of up to 60 metres, while standard suctions pumps are limited to maximum 8 metres.

Large diameter hose of 150mm is deployed at speeds of up to 40 km per hour and recovered at 1 km every 30 min.

Special flood pumps will turn a standard fire brigade unit into a high volume pumping-out appliance, pumping 50,000 litres per minute from carparks and tunnels.

No wonder multiple Australian industrial fire brigades rely on Hytrans to deliver the water they need to do their job.

www.bluemont.com.au

Bruck Textiles

Booth 125/128

Bruck Textiles is an Australian owned company producing quality fabrics in Australia since 1946.

We are Australia's leading innovator in technical textiles providing high performance and protective fabrics for use in applications such as Military, Fire Fighting, Station Wear, Law Enforcement and Metal Splash. Our fabrics protect tens of thousands of professionals and volunteers with BRUCK® protective products specified by emergency services in Australia and New Zealand.

BRUCK® products are world class and deliver innovative fabric technology solutions for Station Wear, Wildland and Structural Firefighting end uses.

Bruck continues to be the market leader with the recent developments of advanced textiles such as Sentinel®, ENFORCER® 24K with PBI® and FORTRESS 3GPlus™ to name a few, providing assurance for the safety of those engaged in important yet hazardous work.

Bruck is the only Australian weaver that manufactures DuPont™ Nomex® fabric, proprietary PBI Gold® and PBI Matrix® outer shells and is the only PROBAN® licensee operating in the region.

www.brucktextiles.com.au

INTERSPIRO
TECHNOLOGY
PROTECTION
CONFIDENCE
TRELLCHEM®

AFAC16
STANDS
188 & 193

Interspiro and Trellchem.

Pairing the world's foremost protection equipment for emergency response professionals.

BUY A PRODUCT — GET A SYSTEM

The S.E.A. Group®

+61 (0)2 9910 7500
1800 655 129 (Aust. & N.Z.)
sea.australia@theseagroup.com
+61 (0)2 9979 5364
Private Bag 1001, Mona Vale NSW 1660, Australia
Unit 35, 1 Jubilee Avenue, Warriewood NSW 2102
www.theseagroup.com.au
/theseagroup
Comprehensive training programs available on website and as app.

Certified System™
Quality
ISO 9001

Bullard Asia Pacific PTE Ltd

Booth 75

We are thrilled to introduce the new X Factor line of Thermal Imagers. X Factor enhances the Eclipse® LD, T3 Series, and T4MAX with the latest advancements in thermal imaging technology. Specifically, X Factor boosts image quality dramatically. Infused with proprietary ICE™ technology, X Factor Thermal Imagers perform brilliantly, enabling firefighters to clearly see critical details, such as exits, doorways, and victims in the same image as heavy fire conditions. Simply put, these products give firefighters the Best Image Quality. Ever.

In tandem with the X Factor launch, Bullard is announcing a special, limited-time Upgrade Program that enables users of Bullard and competitive TIs to upgrade their units for a fraction of the cost of new units.

Additionally, all new X Factor TIs come standard with a five-year warranty on parts and labor. Bullard is committed to innovating thermal imaging products and programs, and we're excited to bring these great new products to the market. And, we're proud to be on the forefront of getting the latest TI technology in your hands. We look forward to seeing you at our booth #75.

About Bullard

Bullard is an internationally known manufacturer of high-quality personal protective equipment and systems designed to help save lives. Founded in 1898, Bullard serves workers in the industrial, fire, and law enforcement markets with product lines that include respiratory protection devices, hard hats, face protection, thermal imagers, and fire and rescue helmets.

www.bullard.com

Burnology PTY Ltd

Booth 28

Burnology develops innovative solutions to complex emergency management problems. Our flagship product "Burnology | Unite" sets a new standard in emergency management command and communication at the field, incident management team and co-ordination levels. It is a map centric, cloud based, real time mapping, collaboration and information management system for use by office staff (e.g. Incident Management Teams) and field staff (e.g. fire fighters) before, during and after emergency incidents.

There are shared maps which office and field staff may add to or modify with all changes visible to all users in real time. This feature enables real time spatial collaboration between the office and field and real time tracking of field resources. Unite also includes a range of logs and the ability to capture, transmit and store photos. The system uses artificial intelligence to 'learn' between prevention activities and subsequent incidents, and facilitates the collection of local knowledge during normal daily activities, that is automatically and spatially available in the event of an incident. All changes made in the system are automatically time and user stamped improving accountability.

The system is user configurable and can be quickly and easily configured for any event or emergency. The user interface is simple with minimal training required. Unite works on any web-enabled device including computers, tablets and smartphones, including offline, without the installation of any software.

www.burnology.com.au

Bushfire and Natural Hazards Cooperative Research Centre

Booth 290

The Bushfire and Natural Hazards CRC is providing a long-term research base that directly supports fire, emergency service and land managers as they work to prevent, prepare for, respond to and recover from natural disasters.

The research program is largely end-user driven, and draws together all of Australia and New Zealand's fire and emergency service authorities and land management agencies, non-government organisations and leading experts across a range of scientific fields to explore the causes, consequences and mitigation of natural disasters.

The research is based around three broad themes, which span the priorities for those working in a multi-hazard environment. The themes are:

- Economics, policy and decision-making
- Resilient people, infrastructure and institutions
- Bushfire and natural hazard risks

The utilisation of the research through fire, emergency service and land management agencies to the benefit of the broader Australian community is critical, and a key driver of the research that is building a more disaster resilient Australia.

www.bnhcrc.com.au

Chubb Fire & Security

Booth 117/122

Chubb Fire will be proudly attending the 2016 Australasian Fire and Emergency Service Authorities Council (AFAC) Annual Conference in Brisbane, Queensland. In line with AFAC's theme "Getting the Balance Right", Chubb Fire will be showcasing its diverse range of fire and safety products that enable our customers to do what they do best – protect assets and save lives, reduce risk and work in safe environments.

Chubb will be showcasing a variety of new products at AFAC including next technology foams from Angus Fire UK, next generation rescue systems by Weber Hydraulic and other new and exciting products. Other products that highlight Chubb's far reaching capabilities within the fire fighting and rescue arena include:

- Angus Fire UK – quality Type 3 Fire Hose, Fire Fighting Foams and foam equipment
- Respirex – a range of high quality personal and respiratory protective garments
- BlazeTamer380™ – Australian developed Aerial Fire Fighting Water Enhancer Technology.
- Protek Fire Fighting Equipment – from handline nozzles to monitors, Protek is a leader in the fire equipment industry and a preferred brand amongst Australian fire-fighters
- Siebe Gorman – providing respiratory protection equipment for 200 years.
- FLIR – Thermal Imaging Cameras and Aerial Thermal Imaging Systems for the future.

To learn more about the diverse range of products and services that Chubb Fire has to offer, come visit us on Stands 117-122.

www.chubb.com.au

Emsina ACT Emergency Services Agency

Booth 337-338/340

Like a demonstration on the latest technologies in mapping used across the emergency services sector? Do you have a smart phone, iPAD or tablet PC and need to know what 'apps' to install for use in emergencies? Do you know what mapping services are provided for within your agency?

EMSINA members will be on hand in the 'EMSINA Spatial Play Pen' to walk you through the latest in mapping technologies for emergency management. We would like to assist those just starting to navigate the mobile maze who need help with which apps to choose for their smart device such as iPhones, iPAD's and Android tablets, as well as those interested in what other emergency teams are using – come and see us!

The Emergency Management Spatial Information Network Australia (EMSINA) is now in its 6th year in partnership with the annual AFAC conference in promoting mapping and spatial technologies as an aid to decision making for emergency services workers. In 2015, EMSINA is doing this in two ways: 1) through our booth the 'EMSINA Spatial Play Pen' within the Trade Exhibition Hall, and 2) via our hosting of the post conference professional development workshop 'Mapping and Location technologies – are you up to speed with all the possibilities'.

EMSINA is a vibrant and active group of practitioners in the emergency management sector committed to improving the safety for Australians through the use of sound decision making, supported by spatial information technologies. EMSINA was formed in Canberra on 11 October 2002 and consists of mapping practitioners from all state and territory emergency agencies, as well as Federal Government departments such as Emergency Management Australia, Geoscience Australia, Department of Defence, and the Bureau of Meteorology.

Drop in to see the EMSINA members in the trade Exhibition Hall and watch the hands on demonstrations of the latest technologies in desktop solutions and mobile apps used by emergency organisations across Australia for mapping.

www.emsina.org

EVTA Group

Booth 35

EVTA Group, originally formed in 2009 as Emergency Vehicle Technologies Australia, rebranded in 2014 at the time of upgrading our facility to a purpose built workshop in New Gisborne, Victoria. EVTA Group provides the emergency services with engineering consultancy and products related to emergency response vehicles and life protection.

The products that EVTA Group represent within Australia and New Zealand include Fireco Telescopic Masts and Fire Fighting Equipment, SRS Vehicle Roller Shutter Doors, Martin KFZ-Technik GmbH 12/24V and 230V (up to 8KVA) Vehicle Driven Generator Systems, and Storm King Mountain Technologies Fire Barrier Curtains and Fire Lagging Material. EVTA Group also supply Telescopic masts and generator systems into markets such as Mining, Communications, Photography, Security and Surveillance, Military, and Wind Power Generation. EVTA Group has recently developed the Red Door Gel Crew Protection System which provides burn over protection for fire vehicles using minimal water and fire blocking gels.

www.evtagroup.com.au

KINETIC

K-SAFE
DRAG RESCUE DEVICE

K-MOVE
SHOULDER SOLUTION

K-MOVE
ELBOW SOLUTION

K-SAFE
POCKET FLAPS

K-TREND
ID

K-TREND
COLOUR DESIGN

K-MOVE
PERFECT FIT

K-SAFE

New integrated safety and rescue components

K-MOVE

Ergonomic functional design combined with innovative materials

K-TREND

State of the art features in shape, colour and individual customer variations

K-TREND
COLOUR IMAGES

K-SAFE
POCKET SYSTEM

K-SAFE
HAND PROTECTION

K-MOVE
KNEE SOLUTION

! **Available in several outershells and moisture barriers.**

VISIT US AT
WWW.LIONINTERNATIONAL.COM

LHD GROUP HONG KONG LTD.
Unit 1003-1004 . 10/F . Block 3
Tins' Center . No.3 Hung Cheung Road
Tuen Mun . N.T. . Hong Kong
P (+852) 2463 2982 . F (+852) 2463 2770
daniel.vonchamier@lhd-group.com

LHD GROUP AUSTRALIA P/L
Unit 3 . 15 Dunstan Road
Wingfield . South Australia
5013 Australia
P (+61) 8 8139 7777 . F (+61) 8 8139 7788
lhdaustralia@lhd-group.com

LION

Ferno Australia

Booth 176-177

No one can predict when emergencies will happen, but Ferno can help you prepare for it with the most comprehensive range of tried and true rescue equipment offered in Australia.

With over 40 years' experience, Ferno has built a portfolio of leading patient extrication, immobilisation and transportation products for traditional rescue scenarios through technical rescue and mass casualty/disaster response and treatment.

At AFAC 2016 Ferno will be showcasing a selection of efficient, durable yet lightweight rescue equipment and introducing to Australia the longest most versatile and successful rescue pole system in the world: the Reach and Rescue Telescopic Rescue System.

Comprising a telescopic pole fitted with an appropriate tool attachment, Reach and Rescue enables rescuers to accurately deploy a flotation or rescue device to a casualty from any distance up to 17m. The system is exceptionally versatile due to its large selection of flotation, retrieval and access attachments that range from body hooks and grapplers to underwater inspection cameras and trigger blades for lopping branches.

Already a proven success with fire and emergency services throughout Europe, Ferno is confident the Reach and Rescue System will prove indispensable for on-water, underwater, on-ice, mud, confined space and height access scenarios while improving rescuer safety.

For a hands-on play with Reach and Rescue and other technical gear, visit Ferno Australia at AFAC Stand 176 – 177.

FERNO

www.ferno.com.au

Firelogistics

Booth 83-84

Through firelogistics the RAPP Australia brand designs, develops and provides first response, emergency and hospital medical equipment and supplies that are effective, reliable and safe to use.

An Australian owned company, RAPP Australia has been in operation for over 30 years and holds multiple contracts that are concurrent with all State Governments for the supply of a variety of products including:

- rescue gear,
- drip torches,
- couplings,
- high rise kits,
- hoses & wyes,
- long spine boards,
- wind meter devices,
- flexitanks & helitanks,
- navigation equipment,
- FLIR thermal cameras,
- equipment bags & harnesses,
- turn out wet & dry bags,
- Pumps,
- weather & monitoring equipment
- valves,
- and many more.

RAPP Australia is dedicated to the provision of fire fighting equipment that adheres to the visions of each of our services, that is:

- Effectiveness
- Reliability
- Safety of Use

To view these products listed above and more go to www.firelogistics.com.au. Please join RAPP Australia at booth 83-84 to see our products on display – arrive interested, leave educated and motivated.

firelogistics

Fire Rescue Safety Australia (FRSA)

Booth 51/58

Fire Rescue Safety Australia (FRSA) is an organisation that operates in parallel to those who strategically work in emergency management. We are professional equipment suppliers who provide expertise in equipment selection, asset management (service / maintenance) and a range of value added solutions including labour hire and consultancy. Our ability to coordinate a solutions for our clients to ensure standardisation and a seamless supply chain management process is what separates our business from traditional suppliers.

We represent several international equipment manufacturers exclusively across Australia some of which extend into New Zealand and various countries around the Asia Pacific region. Some of our partners are listed below.

- Holmatro Rescue Equipment
- Elkhart Brass
  – Nozzle / Monitors
- Avon Protection / Argus
  – Thermal Imaging Cameras
- Biomarine
  – CCBA / Rebreathers
- Fire Service Plus Inc
  – FireAde 2000 Eco Foams
- Nardi – HP Breathing Air Compressors
- SIT / SafeQuip
  – Water Rescue PPE and Inflatable Rescue Craft
- Pax – EMS Bags
- Ansell Microgard Chemical Protective Clothing

FRSA is a partner whom you can trust to provide the right advice and support through the emergency management cycle. Our team of professionals have strong backgrounds and expertise in varying disciplines of emergency response and provide exceptional levels of support around the clock when you need it most.

www.frsa.com.au

FRSA
Fire Rescue Safety Australia

FOR YOUR PROTECTION

PACIFIC F10 MKV STRUCTURAL HELMET
Certified to AS/NZS 4067:2012

PACIFIC FACE SHIELD & EYE PROTECTOR
Certified to AS/NZS 1337.1:2010

STANFIELD'S FH33 NOMEX FLASHHOOD
Certified to NFPA 1971:2013

PACIFIC F3D MKII STRUCTURAL HELMET
Certified to AS/NZS 4067:2012

NEW TO AUSTRALIA:
AS/NZS1716
P2CV TWIN VALVE
VERTICAL FOLD MASK
Additional valve provides further relief from heat and moisture build up inside the mask

ESKA SUPER MARS PLUS GLOVES
Certified to AS/NZS 2161.6:2014 Level 3

BRISTOL UNIFORMS CLOTHING (JACKETS & TROUSERS)
Certified to AS/NZS 4967:2009 Level 3

YOUR ONE STOP SHOP FOR
FIRE PPE
WWW.PACFIRE.COM.AU

YDS POSEIDON BOOTS
Certified to AS/NZS 4821:2014

PAC FIRE AUSTRALIA

PHONE AU 1300 731 800
SALES@PACFIRE.COM.AU
WWW.PACFIRE.COM.AU

PACIFIC HELMETS · eflare Corporation · YDS · eska · UK Underwater Kinetics · BRISTOL

Global Fire Solutions PTY Ltd

Booth 33-34

Global Fire Solutions is a family business started in 1999 with son Damian joining us in 2009 to ably assist in our proud representation of some of the world's leading manufacturers of fire apparatus.

Our association with Darley and Fire Research/FoamPro spans more than 30 years and since 1991 with Bronto Skylift.

These highly regarded international companies and the more recent additions PolyBilt, PyroLance and Harrison Hydraulics provides us with a fantastic varied product line to offer our customers.

Our customer base includes Fire Services in every state and territory in Australia, the Defence Department and the Mining Sector. We also represent Bronto Skylift in New Zealand.

We are also proud of our relationships with the major OEM's who are keen to join us in bringing effective, efficient and innovative products to the Fire Services.

Particularly pleasing in 2016 is the contract award to be the major supplier for MFB's new generation Ultra Large Pumper currently in production at SEM Fire and Rescue. This appliance incorporates the first fully built up PolyBilt body and tank in Australia. It features a 8000lpm rear mount Darley EMRH2000 pump, fully electronic FRC/FoamPro A and B class direct injection foam systems and a separate Deutz diesel driven Darley HEBC 2000lpm CAFS system.

A 3rd Bronto Skylift model F44RLX for the MFB is soon to be completed at Bell Environmental in their Narangba Qld. facility. A total of 73 Brontos ranging from 17m to 44m are now serving in every mainland metropolitan Fire Service in Australia and New Zealand providing versatile reliable aerial operations. Bronto Skylift introduced their new range of hydraulic elevating platforms called the XR at Interschutz 2015. The XR is currently available in operating heights of 45m and 60m with other sizes available in the near future. Upgraded electronics, better outreach, larger cage and new boom and outrigger construction are features of the new model.

↘ **twing@globalfiresolutions.com.au**

Gore & Associates (UK) Ltd

Booth 29

Gore's revolutionary GORE® PARALLON™ System will be on show at AFAC this year along with the company's range of high performance protective fabrics.

After several years of research, bringing together its technical expertise from around the world, Gore has developed a solution that removes the need to compromise comfort for thermal protection.

The GORE® PARALLON™ System is lightweight, breathable and waterproof, delivering high levels of thermal protection in firefighter Personal Protective Equipment (PPE). It reduces the risk of burn injuries and heat stress in wet and dry conditions.

The GORE® PARALLON™ System has been developed to combat the risks associated with moisture and heat stress by introducing a unique new solution that incorporates a highly breathable Gore thermal barrier combined with a GORE-TEX® or CROSSTECH® Moisture barrier.

The full range of Gore fabrics developed for firefighter safety includes the GORE-TEX Fabric and CROSSTECH Fabric moisture barriers, which play a vital role in structural firefighting garments, providing durable, waterproof, breathable protection. Gore fabrics protect against the extremes of firefighting while keeping the wearer dry from inside and out.

Garments that incorporate Gore technology exceed industry standards for waterproofness and resistance to heat and flame. They provide firefighters with an increased level of comfort that is proven to enhance performance.

↘ **www.gore.com**

HAAGEN Fire Training Products

Booth 255-256

HAAGEN's portfolio includes some of the largest multidisciplinary fire training campuses in the world. You may recognise us for our large scale projects like the Victorian Emergency Management Training Centre (VEMTC) in Melbourne or the Country Fire Authority's mobile fire training fleet, but you can count on HAAGEN for any type or size of fire training: from basic fire prevention to full-scale immersive firefighter training.

Our range of products stretches from fire extinguisher training systems to live-fire and digital firefighter training tools, delivered in both standard and custom built solutions.

We're committed to helping you support your trainees and the skills they need to learn in unique ways. With HAAGEN, you can master the basics before building up to live-fire training — and beyond. Our digitally enabled products offer the same unpredictability and variety you'll see in actual emergencies. Plus, they're safer and easy to repeat. Then, we can help you execute Class A and Gas-Based burns that align with your training objectives, when your trainees have the skills to manage them. Because many of our products work together seamlessly, you can think of our tools, props, and facilities as pieces of a bigger puzzle. You can add onto your existing program instead of buying new equipment every year as your needs change. You can give your people the skills, knowledge, and experience they need today and in the future. You can stretch your budget. And best of all, you can get them home safe.

↘ **www.haagen.com**

HAAGEN®

ECO-DRYSHIELD
A HAINSWORTH TECHNOLOGY

ECO-DRY Shield has been developed specifically with the requirements of wildland firefighters in mind.

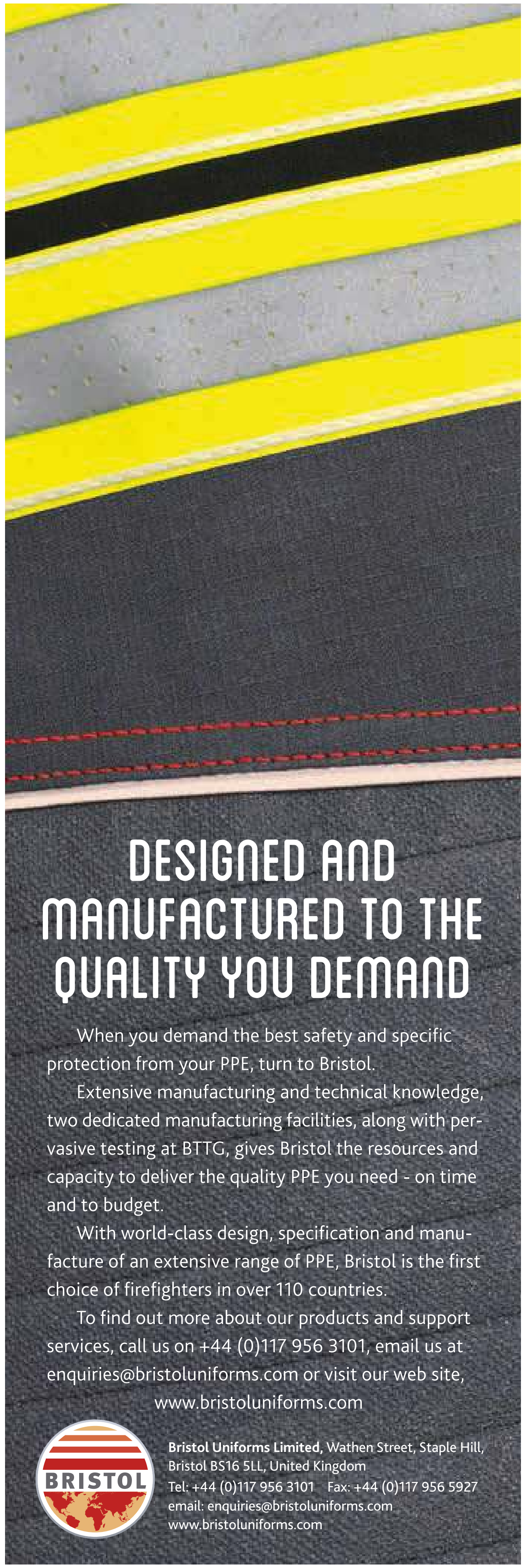
This necessitates that the garment be comfortable to wear during high activity levels, during which the user is exposed to extreme radiant and convective heat. A lightweight single layer construction combines the comfort of Australian Wool and Lenzing FR, with the thermal performance of DuPont™ Nomex® to allow mobility and flexibility as required during prolonged call-outs whilst at the same time providing maximum thermal protection.

Design That Saves.

HAINSWORTH®
TECHNOLOGY

+44 (0)113 257 0391
protectsyou@hainsworth.co.uk
www.protectsyou.co.uk

/protectsyou @protectsyou



DESIGNED AND MANUFACTURED TO THE QUALITY YOU DEMAND

When you demand the best safety and specific protection from your PPE, turn to Bristol.

Extensive manufacturing and technical knowledge, two dedicated manufacturing facilities, along with pervasive testing at BTTG, gives Bristol the resources and capacity to deliver the quality PPE you need - on time and to budget.

With world-class design, specification and manufacture of an extensive range of PPE, Bristol is the first choice of firefighters in over 110 countries.

To find out more about our products and support services, call us on +44 (0)117 956 3101, email us at enquiries@bristoluniforms.com or visit our web site, www.bristoluniforms.com

BRISTOL

Bristol Uniforms Limited, Wathen Street, Staple Hill,
Bristol BS16 5LL, United Kingdom
Tel: +44 (0)117 956 3101 Fax: +44 (0)117 956 5927
email: enquiries@bristoluniforms.com
www.bristoluniforms.com

Hainsworth Technology

Booth 63

Hainsworth Technology has been working with firefighters around the world for over 100 years.

Our expertise goes well beyond just manufacturing fabric. We aim to set the benchmark in innovative protective fabric for today's modern emergency service personnel.

Hainsworth Technology's three core messages are: Design that Saves; Protection that Shows and Quality that Lasts.

Our technologies consist of TITAN, ECO-DRY and ADVANTAGE.

Every product developed by Hainsworth Technology is subject to the most stringent levels of testing in our on-site UKAS accredited laboratory and the design of each fabric is influenced by the environment in which a firefighter operates and how the garments will be worn.

We have recently introduced TITAN 1260 to complement the existing 1220 and 1250 systems by adding flexibility after flashover with the fabric remaining flexible with minimal carbonisation, ensuring the garment remains intact and does not break open after exposure to flame and cooling down.

Our ECO-DRY Shield fabric has been developed over a number of years to specifically meet the requirements of wildland firefighters facing the most challenging of circumstances.

ECO-DRY Shield combines the unique properties of wool, Dupont Nomex® and Lenzing® FR to offer the best solution for wildland firefighters.

The single layer construction incorporates the unique comfort of Australian wool with the thermal performance of Nomex® to allow the flexibility and mobility required by fire crews.

ADVANTAGE is our range of fabric finishes that provide durability even after repeated laundering.

www.protectsyou.co.uk

Harcor

Booth 304-305

With over 45 years of experience and expertise, Harcor offer an impressive range of robust off-the-shelf emergency services products and custom solutions. This includes the design and manufacture of premium emergency services bags, security seal products used to secure fire extinguishers, medical cabinets and more.

The Australian emergency services authorities and Harcor's product development team have formed close ties, and in conjunction with them, Harcor have developed a selection of hard-wearing purpose built fire fighter bags and rehab products.

The Fire Awareness award winning Harcor Arm Core Cooler Harness is one of Harcor's unique rehab heat stress recovery products. The Arm Core Cooler Harness is designed to reduce core body temperature fast in order to combat heat stress plus speed up recovery. This is achieved by hand and forearm water immersion. Studies from around the world have shown forearm and hand submersion cooling to have significant advantage over ice packs, cooling vests, misting and other forms of passive cooling methods.

As an emergency services bag manufacturer, Harcor offer most bags in a number of colours and sizes to meet exact requirements. The team at Harcor are able to offer ideas and experience, from concept to development and manufacture. Contact Harcor to discuss your special needs, including made-to-order bag sizes, materials, colours, printing and other features.

Strategically located throughout Australia; with branches in Sydney, Melbourne and Brisbane; our company works in partnership with clients providing tailored solutions for the emergency services sector; supported with the best possible service guaranteed!

www.harcor.com.au

Hatz Diesel Australia

Booth 211-212

Most people don't know that Hatz Diesel supplies 80 per cent of the diesel engines in Australia's fire fighter pumps – and Hatz is proud of that.

Sami Almogawish, Managing Director of Hatz Diesel Australia, says Hatz engines don't attract much notice because they never fail.

"Hatz has an impeccable record. In fact, the fire industry has never reported a Hatz engine fail in the many years that we have been supplying Australia's fleet," Sami says.

Sami and his team are on high-alert during the Australian bush fire season and Hatz keeps the Sydney parts and service centre on standby to ensure an immediate response should a call come in from the fire service for parts.

"Hatz's response time is impressive and when it comes to supporting the fire industry we are ready to deliver anything the fire service needs to keep their Hatz engine operating," he says.

"We haven't had that call yet, but we're ready for it. Water supply is obviously vital during a fire emergency so the pumps simply have to work," he says.

Hatz Diesel provide support for fire services Australia-wide. They even offer Hatz service technicians to be on standby at an emergency. This ensures help is on-hand, if required.

Hatz Diesel's innovative H50 water-cooled engine series offers the lightest and most compact engines on the market and now includes an all new three cylinder version, which Sami says is ideally suited to the fire industry.

www.hatz.com.au

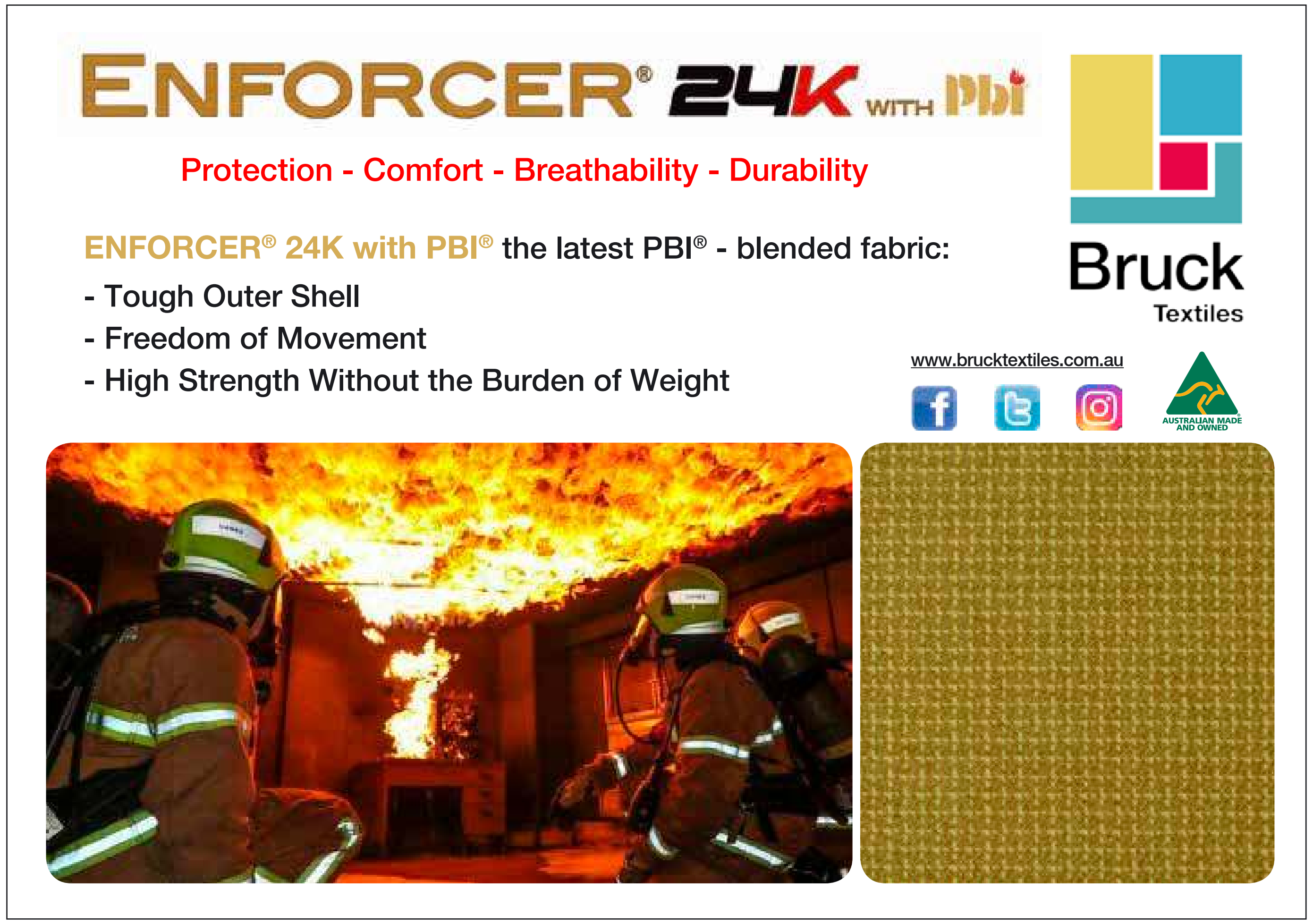
YOUR PARTNER IN THE SKY

BRONTO SKYLIFT

Over 70 Bronto units operational in Fire Services around Australia and New Zealand!

Please contact Bronto Skylift Aust./NZ
trevor.wing@brontoskylift.com
tel. +61 (0) 407 901474

www.brontoskylift.com



ENFORCER® 24K WITH PBI

Protection - Comfort - Breathability - Durability

ENFORCER® 24K with PBI® the latest PBI® - blended fabric:

- Tough Outer Shell
- Freedom of Movement
- High Strength Without the Burden of Weight

Bruck
Textiles

www.brucktextiles.com.au

AUSTRALIAN MADE AND OWNED

HD Fire Protect Pvt. Ltd

Booth 134

For over 26 years, HD Fire Protect has been on fore-front in design, development and manufacturing of water and foam based fire-fighting products. Today, HD products have been tried, tested and successfully accepted in over 60 countries worldwide.

HD product line is extensive and products carry several approvals including UL, FM and CE. Our product range mainly consists of Deluge Valves & Accessories, Water Spray Nozzles, Sprinklers & Alarm Check Valves, Fire-Fighting Monitors, Fire Suppression Foams, Equipment and Systems, Mobile Foam Units, Foam Sprinklers and Custom Engineered Fire-Fighting Skids. HD Fire Protect is certified to the ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007 by TÜV NORD.

We serve numerous sectors such as oil & gas, petrochemical, power, aviation, steel plants, pharmaceutical and building industry. The cornerstone of our business is the strong relationship with our customers. While we serve many of reputed companies around the world, the right combination of product quality, efficiency in manufacturing, service excellence and domain expertise offers our customers a perfect value package.

A global reputation for excellence in product design, quality, reliability and the highest levels of customer service makes us your ideal partner for fire-fighting solutions.

www.hdfire.com

JPI Australia

Booth 101/104

JPI Australia is an exciting new player in the world of Government Procurement and OEM manufacturing. The strong and diverse team at JPI pride ourselves on our ability to listen and work with each client to create unique, high quality, fit for purpose apparel and accessory solution that is delivered to meet any customers manufacturing and supply chain needs.

We are a well-appointed company that can provide an end to end solution for any design, merchandising, fabric selection, sampling, production and distribution requirements.

JPI through its main brand Jetpilot has secured over 30 years an extensive array of specialist vendors from all over the world, each of these vendors have been built up as trusted partners of JPI to ensure we can deliver to our clients.

Currently we manufacturer for the Queensland Fire and Emergency Services since 2014. Throughout this time, we have demonstrated our ability to listen and work with QFES to innovate and adapt to their work systems. Our team have developed a patented performance fabric trademarked Cool-lite, which offers superior sweat management along with a list of other significant key features.

This fabric was specifically designed for the QFES range and has been proven to support their team and improve their performance while maintaining a professional appearance and coming in on budget

We are also currently manufacturing uniform's and PFD's for Queensland Surf Lifesaving since 2013 and also manufacture for other clients such as BRP/Seadoo, Honda, Yamaha, Toyo Tyres, AME Events and Milwaukee Tools to name a few.

www.jpihq.com

Kestrel Aviation / Erickson

Booth 1

Kestrel Aviation has a strong partnership with Erickson Inc. to provide the leading capability for heavy lift firefighting currently available for Australian bushfires, the S64 Aircrane Helitanker. Erickson and Kestrel's combined resources deliver the most effective aerial firefighting technology available in Australia with a combination of medium and heavy helicopters and unsurpassed tank delivery systems. Erickson's 18 year history in Australia has provided the strongest impact on the fire front and has taken the package to a new level with the Kestrel partnership.

This is truly a unique combination of firefighting strength and support Australia-wide and has enabled Kestrel to successfully win 17 government contracts for firefighting helicopters, covering the full spectrum of capability required by the various agencies around the country. The combined contracted fleet ranges from light reconnaissance and air attack platforms, through to the versatile and efficient medium Bell 212/412 fleet and at the other end of the spectrum with the hard hitting and all powerful Erickson S64 Helitanker, capable of delivering up to 9500 litres of water

The fleet is supported by a team of over 60 people during the fire season, including highly skilled pilots, engineers and support crews who are recognised experts in the field with experience fighting some of Australia's largest and deadliest bushfires.

Erickson and Kestrel are committed to continue to support the communities of Australia against the perils of wildfire as a united team with the dedicated members of the fire agencies on each and every fire front.

www.kestrelaviation.com.au
www.ericksoninc.com

LHD Group Australia

Booth 198/203-204

LHD Group Australia has catered to the Australian/NZ Emergency Services and Law Enforcement sectors for over a decade by providing premium PPC and uniform solutions and services. We are a subsidiary of LHD Group GmbH, a leading global system provider in the management of professional and protective clothing and footwear.

Particularly in the field of PPC, our LION brand is globally renowned for its continuous pursuit to cater for the growing needs of today's firefighters and rescue members. For more than 110 years, the LION brand has been a synonym for functional and high standard protective clothing and uniforms, and ensuring the health, safety and performance of our heroes in their everyday life, with the highest possible quality.

Our Products

"Tip to Toe" solutions via design and supply of PPC and uniform items incorporating the latest designs, technologies and innovations that continue to set new standards in quality and function. Our objective always remains the same: The safety of our customers! via developing next generation PPC that accommodate diverse operational environments, applications and climatic conditions and that afford the best possible ergonomics with maximum protection by means of weight-saving design, functional performance, durability, comfort and state-of-the-art materials.

LHD has made its mission to develop PPC in a way to maximise protection whilst minimise fatigue and the physiological constraints on the wearer.

LHD employs a TotalCare® system for numerous international and Australian clients for the supply, distribution/wardrobe management, care, laundering, repair and maintenance of all clothing/PPC and footwear items. The very essence of the TotalCare® model is to add maximum value, by optimised and expert coordination of clients clothing/PPC supply and wardrobe management system. LHD pioneered this concept and is field proven globally with TotalCare® centres operational across the globe.

www.lhd-group.com.au

Mercedes-Benz Aust/Pacific PTY Ltd

Booth 251-254

Mercedes-Benz is displaying the ultimate factory-prepared fire-fighting truck solution on its stand.The German company has a long history of making fire and rescue vehicles, and the new Unimog is a prime example of this expertise.

The Unimog U4000/U5000 is a rugged off-road truck with extreme ground clearance, traction and optional wading ability up to 1200mm.

It can also be ordered with a factory installed safety package developed specifically for fire-fighting, which meets the European Fire Services Standard EN1846 Class S3. This includes fire protection from several key components, including steel guards for items such as the air dryer, catalytic convertor, battery and key brake components, while air tanks have been relocated. Fire-proof sheathing has also been fitted to electric cabling, as well as air, hydraulic and fuel lines.

Fire services can also take advantage of an optional hydraulic system that can operate at pressures of up to 240 bar, which can run an oil-driven engine or external controls, as well as a high-speed PTO for use with commercially available hydraulic pumps.

The Unimog has four-wheel drive system with front and rear locking differentials for ultimate traction. It has single tyres, rather than dual tyres that are less suited to off-road work, and an on-board inflation system that allows operators to drop the pressures for greater surface contact on soft ground.

The Unimog is available with a regular or crew cab. It is powered by a Euro V, 4.8-litre in-line four-cylinder producing 218hp, while a new 5.1-litre four-cylinder Euro VI option is also available.

www.mercedes-benz.com.au/trucks

NewAge Fire Fighting Company Ltd

Booth 191

- UL Listed Monitor and UL Listed Foam Induction Mechanism under UL Standard – 162.
- NewAge UL Listed water cum Foam Monitors offer superior durability in Marine, Chemical, Oil and Gas Sector, Ports, Jetties, Onshore and Offshore Platforms. Made out of Stainless Steel, these monitors are fit for optimum performance where environment is highly corrosive Stainless Steel Material Grade available are SS 304, SS 316 & SS 316L.
- UL Listed Flange Inlet Monitors with UL Listed Fixed Flow & Adjustable Flow.
- 3% Foam Induction is through Self Inducting Non – Aspirating Aqua Foam Nozzle with Jet and Fog Movement and optionally using Jet Ratio Controller Pump.
- Fixed flow capacity would be 500 GPM, 750 GPM & 1000 GPM.
- Adjustable Flow capacity available from 500 GPM to 4000 GPM.
- NewAge Remote Control Monitors are used when Asset is vulnerable and exposed to High Risks especially when reach of Operator or Firemen is limited like Processing towers in refinery, Conveyers in Power plants, Confined Storage Areas, Columns in Chemical Plants etc.
- 3 phase and 1 Phase AC Supply versions are available for Fixed installations Applications like Fire Vehicle, Riot Control Vehicle, Air Crash Tenders, Marine, Etc.

www.newage-india.in

OzLED (Aust) PTY Ltd

Booth 10

OzLED have been supplying products to the emergency service market since it was established back in 1979. Over that period of time, we had been awarded the sole Australian distribution rights for market leading brands such as Sound Off Signal (USA), Labcraft (UK), Base6 (Korea) & 8EVP (Taiwan).

OzLED has built a reputation for being reliably responsive, pro-active and understanding the often complex needs and expectations of emergency services & related industries. Over the years the company has shown an exceptional pattern of growth in key areas throughout the country. It has a proud record of success in a challenging market.

Part of OzLED's success is due to the continual innovation of the product range it offers. In 2014 Sound Off Signal released their nForce© range of products into Australia. It was, and still is, the only true Tri-colour technology offered in the Australian market.

Couple this technology with the Sound Off Signal bluePRINT© control system (released in Australia in 2015) and you get increased functionality which in turn offers greater safety to the vehicle occupants. To complement this system, you can add some Labcraft scene lights (10 year warranty), BASE6 work lights and driving lights, or some powerful slim line 8EVP warning lights as the bluePRINT© system integrates with any brand of light on offer.

www.ozled.com.au

Pac Fire Australia

Booth 135-144

Pac Fire Australia's success is driven by its passion to protect those that are committed to saving lives. Founded in 2000, Pac Fire Australia has established a reputation as a dependable nationwide distributor of PPE and PPC, with a strong commitment to the supply of innovative, high quality Australian certified products . With eighteen employees and representation in all states, Pac Fire Australia supplies every emergency service organisation in Australia in one way or another. Early in 2015, Pac Fire Australia came under new management and we are pleased that Pac Fire Australia remains a family business operating as a subsidiary of Pacific Safety International (New Zealand), alongside Pacific Helmets NZ Ltd.

All Pac Fire Australia products are managed by our highly trained staff while our integrated accounting and business management software, SAP Business One, automates key business functions including financials, sales, customer relationship management, operations and inventory. Our Online ordering system, allows an individual, a station or region to place orders direct on Pac Fire Australia and to be notified of an orders progress, from order entry to despatch. Pac Fire Australia has public, product and workers compensation insurance while operating a Quality Management System which complies with ISO 9001: 2008.

Pac Fire Australia partners exclusively with Pacific Helmets NZ, Bristol Uniforms, Eska, Kappler Chemical Suits, Clipper Bags, YDS Footwear, Underwater Kinetics, Adaro Torches, Ready Rack (USA), POK, OSW Hose, Solberg and Meret to name a few.

www.pacfire.com.au

PAC FIRE AUSTRALIA®

Pelican Products

Booth 227

Pelican Products, Inc. is the global leader in the design and manufacture of both high-performance protective case solutions and advanced portable lighting systems.

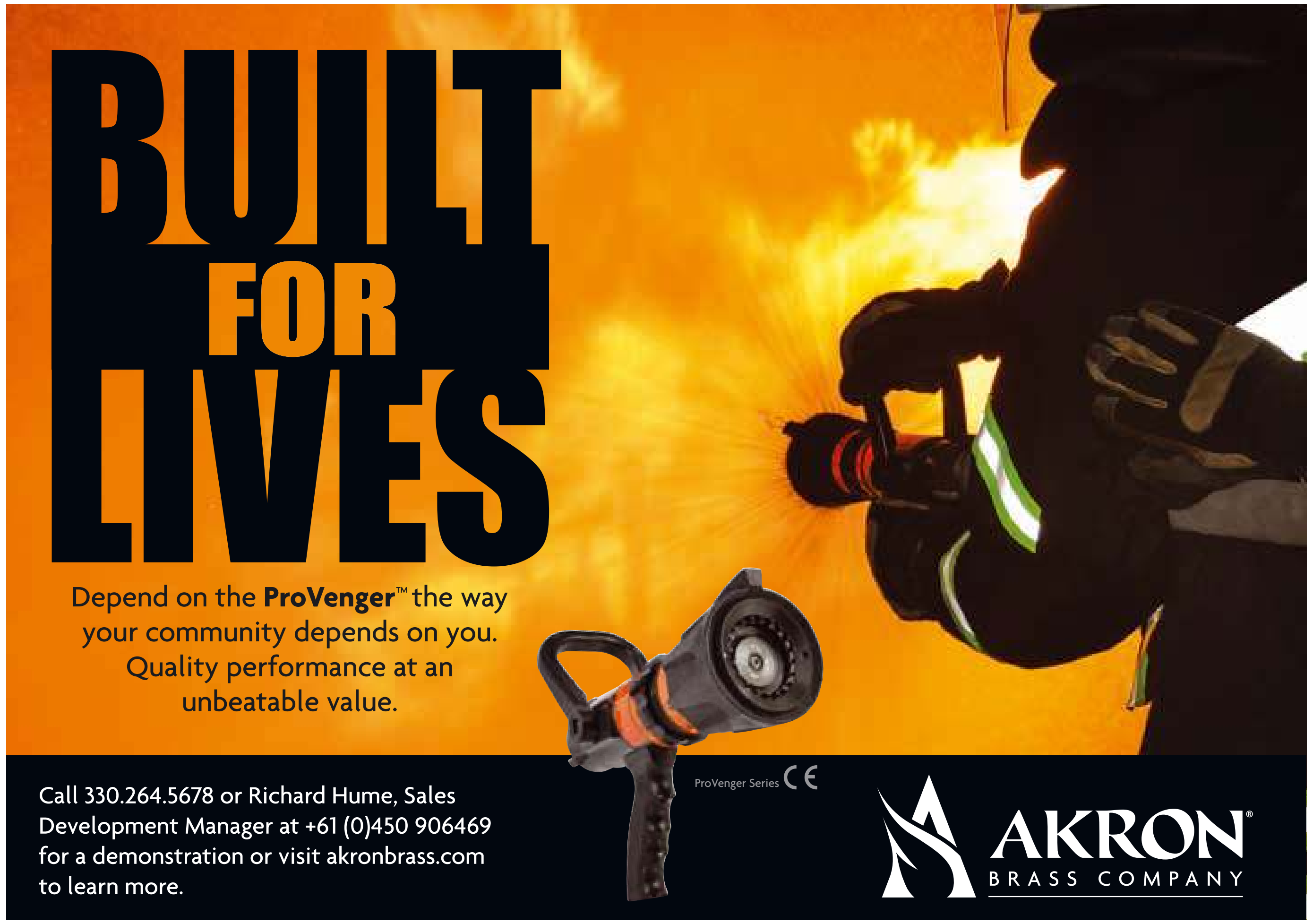
Pelican manufactures a vast array of safety-approved lighting solutions specifically suited to the specialized requirements of the fire and emergency services industry and are designed to ensure that the highest safety standards are met even in the most hazardous of work environments. From hand-held torches and head lights/lamps to lantern style lights and portable Remote Area Lighting Systems (RALS), Pelican advanced lighting solutions are engineered to not just work, but excel, and are IECEx approved.

From the tough-as-nails polymer construction to the industry leading use of LED technology, Pelican Products leads the way with the most effective and reliable safety lights in the fire and emergency services market.

Pelican RALS (Remote Area Lighting Systems) are portable lighting solutions that use advanced LED technology to provide ample light in areas that are either inaccessible by generator-based systems, inappropriate or just plain dangerous. Rechargeable and self-contained, Pelican RALS products run silent, are cordless and don't emit toxic fumes.

All Pelican products are backed by a superior guarantee of excellence. To find the right lighting solution, visit Pelican Products at stand #227 at the AFAC Conference and Exhibition.

www.PelicanAustralia.com


BUILT FOR LIVES
Depend on the ProVenger™ the way your community depends on you. Quality performance at an unbeatable value.
ProVenger Series CE
Call 330.264.5678 or Richard Hume, Sales Development Manager at +61 (0)450 906469 for a demonstration or visit akronbrass.com to learn more.
AKRON® BRASS COMPANY

The trusted and reliable name in front-line fire fighting
Hatz Diesel
Visit Hatz Diesel at AFAC16 Stand 211 & 212
Hatz Diesel Australia
Call 1300 796 900
or visit hatz.com.au
HATZ DIESEL

Phos-Chek Australia

Booth 9

Phos-Chek brand products have a long history of use aiding in effective fire suppression and are recognized worldwide for the excellent benefits they provide. We are committed to continuously providing fire managers and firefighters with the safest, most effective, and environmentally friendly products available. Our first Phos-Chek retardant product became available in 1962. As additional tools for the fire manager, in 1988 we introduced Phos-Chek WD 881 Class A foam and from 2005 Phos-Chek Aqua-Gel and Insul-8 water enhancers. To round out our offering, Flash 21 fuel gelling agent can be used to introduce fire to the landscape.

Our support in Australia extends to Portable Airbase equipment, locally designed and operated to integrate seamlessly into an Incident.

Timely supply of additives and equipment is our goal.

www.phos-chek.com.au

PHOS-CHEK
FIRE RETARDANT | FOAM | GEL

Safety Components, Inc.

Booth 26

While developing fabrics for the fire service, Safety Components dedicates special attention to mobility, protection and durability. The busiest departments and brigades specify Safety Components' fabrics over any other textile company.

Innovative Outer Shell Fabric Designs

PBI Max offers firefighters the best combination of break open and thermal protection in the strongest and most durable PBI outer shell fabric the world has ever seen. Engineered with Filament Twill Technology™, PBI Max provides up to four times greater trap tear strength compared to conventional rip-stop technology. More importantly, the gear weighs less allowing firefighters to move easier while reducing heat stress.

Armor AP, powered by Filament Twill Technology, is an ultra light outer shell with improved comfort/flexibility and increased strength/durability for enhanced protection. Armor AP is designed to meet the needs of firefighters who prefer unrestricted mobility and long-lasting performance at an economical price.

Industry Leading Thermal Liner Technology

Glide Thermal Liners add enhanced freedom of movement and more comfort to turnout gear. Our patented high lubricity weave is up to 25% slicker than other filament based liners and up to 20% lighter than competing face cloths.

Wildlands, USAR and Station Wear Sigma™

Regardless of the tasks at hand, these situations demand lighter, tougher and drier gear. Sigma combines the world's most advanced fiber technology to deliver garments that are lightweight and comfortable, yet provide advanced protection and durability.

www.safetycomponents.com

Safety Equipment Australia PTY Ltd

Booth 188/193

The SE40 from The S.E.A. Group is a CBRN-approved PAPR (Powered Air-Purifying Respirator) that delivers positive-pressure air up to 400 litres per minute. The model has approvals from both NIOSH-CBRN and British Standard CBRN.

The respirator has been found to be ideal for many emergency response operations, and can be completely integrated with a range of fully encapsulated protective suits of various designs and materials. It is used by fire brigades, police forces, medical units, anti-terrorist squads, first responders and other emergency professionals around the world.

The microprocessor-controlled SE40 is a demand respirator – not a continuous-flow respirator. The SE40 constantly monitors the air pressure inside the mask and regulates the fan motor to deliver the required air flow depending on the wearer's breathing.

The standard configuration incorporates two CBRN filters. The respirator has been tested in atmospheres containing live agent warfare agents, such as mustard gas and sarin. The unit can be integrated with a military-grade encapsulated ventilated CBRN suit. The entire ensemble is designed for wet decontamination, and has been field-tested in 1,000 litres per minute water spray over 3 minutes.

Visual and audible alarms alert to any routine task (such as changing the battery), as well as other events that may require attention.

Voice communication is loud and clear – an essential for team operations. SE40 comes with a microphone in the mask and a powerful external mini-loudspeaker.

The PAPR is operated with a single button. It can be worn on a backpack or standard belt. A military style readiness bag is also available.

www.sea.com.au

Attend Australasia's premier emergency management conference backed by a globally recognised trade exhibition

AFAC16
mitigation • response • recovery
powered by INTERSCHUTZ

30 Aug – 1 Sept 2016
Brisbane Convention & Exhibition Centre

Mitigation – Response – Recovery: Getting the balance right

Find out more at:
www.afacconference.com.au

AFAC16 powered by INTERSCHUTZ features
- 2,000+ attendees
- 3 day multi-streamed AFAC16 conference program, including the Bushfire and Natural Hazards CRC Research Forum
- Post-conference development sessions including field trips
- Latest innovations on display in the trade exhibition powered by INTERSCHUTZ
- Networking events
- Expo Stage presentations
- Knowledge Lounge

Supporting Sponsors FUJITSU CAPITA Adashi
Welcome Function Sponsor ISUZU TRUCKS
Lanyard Sponsor GAAM Emergency Products
Catering Sponsor HINO
in association with WAFA

HD FIRE PROTECT

Our Global Philosophy of growth is summed up in one word Trust
Serving over 50 countries worldwide

Manufacturing Excellence
Superior Performance
World-class Fire Fighting Products

HD FIRE PROTECT PVT. LTD.
D-6/2, Road Number 34, Wagle Estate, Thane 400604, India
Tel: +(91) 22 25182600 Fax: +(91) 22 25182602 Email: info@hdfire.com
www.hdfire.com

Solar Developments trading as PVStop

Booth 99-100

PVStop is an Australian innovation that switches off solar panels in seconds, mitigating the risk of DC electrocution to Emergency Services personnel, Electrical Contractors and all owners of Solar Panel Systems.

Did you know that solar panels cannot be switched off when exposed to light? In the case of an emergency situation such as a fire or flood, solar panels continue to produce potentially lethal amounts of DC voltage which poses a risk to emergency services personnel and anyone who owns or is exposed to solar panel systems. In professional terms this risk is known as the "DC Danger Zone" and up until now, there has been no solution to this globally recognised problem.

PVStop is a state of the art polymer film technology that solves this problem, literally acting as a "liquid tarp", switching off Solar Panels in seconds and drastically reducing the risks faced by Emergency Services personnel Electrical Contractors and all owners of Solar Panel Systems.

Luke Williams is a CEC (Clean Energy Council) accredited renewable energy system designer at LJW Solar and is also the inventor and patent holder (2012903137) of PVStop; he has worked in the solar industry since the early eighties, designing and installing solar photovoltaic and wind energy systems for a variety of domestic and commercial clients.

This was a problem that Luke was determined to overcome – "Over the years LJW Solar has become increasingly concerned about solar panel risks and associated solar PV hazards. With over 1 billion solar panels installed globally and 1.5 million Solar panel installations in Australia alone, the need for a solution to combat the risk of DC electrocution in the face of an emergency situation has become paramount, this is the driving reason behind why we developed PVStop".

www.pvstop.com.au

Solberg Asia Pacific PTY Ltd

Booth 79

Solberg is your one-stop resource for high performance, sustainable firefighting foam concentrates and custom-designed foam suppression systems hardware. Solberg has the expertise, capabilities and resources to serve the high-hazard, high-risk market sector globally.

RE-HEALING™ Foam concentrates from SOLBERG are an innovative, high fire performing environmentally sustainable fluorosurfactant and fluoropolymer-free firefighting foam used to effectively extinguish Class B fuels with no environmental concerns for persistence, bioaccumulation or toxic breakdown. RE-HEALING foam concentrates are very effective firefighting foams for flame knockdown, fire control, extinguishment, and burn-back resistance. Control, extinguishing time, and burn-back resistance is paramount to the safety of firefighters everywhere. RE-HEALING foam concentrates have shown excellent performance in each category. Concentrates are available in 1%, 3%, 6% and 3x6% ATC formulations.

ARCTIC™ AFFF, C6 compliant foam concentrates are intended for use on Class B hydrocarbon fuel fires and are available in 1%, 3% and 6% concentrations. ARCTIC ATC™ foam concentrates are intended for use on Class B hydrocarbon and polar solvent fuel fires. Concentrates are available in 1X3%, 3x3%, and 3x6% ATC formulations.

FIRE-BRAKE™ foam concentrate is a synthetic firefighting foam concentrate specially designed to be used for wildland, structural and other Class A fuel fires. The foam concentrate is biodegradable and non-toxic, so it is environmentally sustainable. FIRE-BRAKE foam concentrate is proportioned at a rate of 0.1% – 1.0%.

www.solbergfoam.com

Stewart & Heaton Clothing PTY Ltd

Booth 67/71

In its 25th Anniversary year Stewart & Heaton Clothing (S&H) continues to evolve to meet the emerging needs of the Fire and Emergency services sector in Australia. As a locally owned and operated company we have a proud history of working with fire agencies to develop solutions to their current and future needs. The S&H difference relates not just to the product but the total service package. In an ever changing industry stability, performance and reliability are critical to the agencies and their end users. S&H continue to invest in people, technology and systems to ensure we remain at the forefront with our total supply package.

S&H are proud to have introduced a number of industry firsts;

- First Australian company to be licenced to produce and supply Certified Product to Australian Standards for Structural (AS 4967)and Wildland (AS 4824) garments.
- First company to introduce a two piece ensemble, fire trim tape and "comfortable" flame retardant fabric to the Wildland sector.
- Successfully completed the largest rollout(at the time) of new generation Structural firefighting garments.
- First Australian company to introduce RFID technology into PPC & E for the fire sector.
- Introduced the most comprehensive asset tracking system in Australia for the fire market-LOGIC.
- First and only company to offer and support a comprehensive nationwide supply solution.
- First company to introduce a comprehensive on-line ordering and garment management system to fire agencies in Australia.

www.shcc.com.au

Task Force Tips

Booth 213-214

For over 40 years, Task Force Tips has been providing emergency responders throughout the Australia and New Zealand marketplace with innovative high performance firefighting equipment. Dedicated to designing, developing and manufacturing the most rugged and durable nozzles, water flow appliances and foam injection and application equipment, Task Force Tips' local distribution partners and regional managers are available to support your training and education requirements. Let us know how we can help with your next specification.

www.tft.com

TASK FORCE TIPS
FIRE FIGHTING EQUIPMENT

TracPlus

Booth 108

TracPlus is a real-time tracking service provider using the latest satellite, web and mobile technology. We deliver secure global tracking information, visible on a range of user devices, to private, business, military and government customers worldwide.

With the ability to choose tracking equipment and mapping software that fits your unique needs, TracPlus delivers unprecedented flexibility in meeting the specific requirements of commercial and private operators, NGOs and government organisations alike. TracPlus software works with an ever-growing range of tracking terminals from multiple manufacturers, allowing operators to mix and match terminals across land, sea, and air assets according to their specific mission and regulatory requirements.

TracPlus continually identifies, evaluates and implements support for "best of breed" products that have proven their credentials in the support of life and limb operations in the aviation, maritime and terrestrial markets.

Integration – Enhance your existing operational systems with real-time tracking, event and messaging data.

TracPlus protects your ICT investment by delivering real-time location and event information into new and existing third-party systems including command and control, operational support, maintenance, scheduling, accounting and geographical information systems (GIS).

Reduce administrative workload, training costs and implementation time whilst streamlining your business, gaining new insight without having to replace your existing systems.

Our 24/7 emergency monitoring and notification service escalates incidents immediately, giving your operational and safety risk teams the confidence they need.

www.tracplus.com

UL International Australia Pty Ltd

Booth 153

UL is a premier global independent safety science company with over 120 years of expertise in verification, testing and certification. It's more than 10,000 professionals are guided by the UL mission to promote safe working and living environments for all people. Delivering market access solutions for Europe, the Middle East and the Americas, UL offers the highest level of regulatory acceptance market recognition for the building and life safety technology sectors which include security, fire suppression, personal protection equipment and more. UL covers every need in fire safety testing. UL offers a broad portfolio of fire safety testing that can assist our customers in proactively identifying and evaluating unique fire safety concepts as well as fire suppression techniques when protecting property. These investigations include performance-based fire testing that can efficiently and cost effectively simulate a fire safety challenge, such as the mitigation of special hazards associated with unusual storage scenarios, unique applications or challenging environments. In addition, UL offers a comprehensive fire apparatus testing program dealing with both newly manufactured apparatus and in- service apparatus, as well as product inspections at manufacturing facilities to help maintain UL product safety certifications.

UL has written over 150 U.S. fire safety standards. We provide authorities having jurisdiction (AHJs), insurance companies, architects, designers and building owners with the information they need to verify fire suppression product performance, reliability and suitability. All of those involved in protecting the public from fire recognize and implicitly trust the UL Mark, a benefit our customers can leverage to differentiate their products.

www.UL.com

Varley Group

Booth 163-164

A major branch of the Varley Group of Companies is Varley Specialised Vehicles (VSV). With more than 50 years of experience in specialised vehicle manufacture, VSV have produced a variety of custom built vehicles for government and private enterprise at all levels.

VSV are recognised in the industry for high level customer focus, quality certified products and efficient delivery. Their experienced teams work closely with our customers to ensure all functional, operational and aesthetic expectations are met. VSV possess extensive expertise in emergency service vehicle design and production, especially in the fire, rescue, hazmat and command sectors.

Varley remains a 100 percent Australian-owned-and-operated private company, managed by members of the Varley family alongside expert Australian business leaders. This ensures that Varley's products and services remain entirely Australian made for Australian conditions.

VARLEY
EXCELLENCE SINCE 1886

www.varleygroup.com

WATERAX Inc

Booth 19

WATERAX is happy to announce its newest collaboration with Hannay Reels. The improved RANCHER® with a Hannay hose reel!

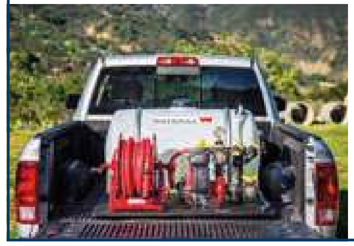
The RANCHER® is a compact and lightweight unit designed for use on ATVs and small utility vehicles. Commonly used in wildland urban interface areas, it allows for rapid access to remote areas that are beyond the reach of standard skid units.

A RANCHER® can be used for a variety of water handling applications such as park and spot fire patrol, prescribed burns, mop-up operations, and general farm and rural community work. It is easy to operate and maintain and can effortlessly slide on and off a vehicle, as needed. You can protect your home and property by using water or foam to fight a structural fire or a wildfire.

Powered by a WATERAX pump, the lightweight MINI-STRIKER® pump pairs a reliable single-stage pump end-driven by a Honda 4-stroke 2.5 HP engine. It ensures quality, reliability, and durability while the non-corrosive piping provides an enduring, robust plumbing system. The entire assembly is firmly mounted on a matte copolymer polypropylene base with rails and cut-outs for easy lifting.

The RANCHER® slip-on unit is brought to you by WATERAX, makers of portable high-pressure fire pumps such as the MARK-3® and the BB-4®, trusted by the wildland firefighting community since the 1920's. Our pumps are as tested and proven as the men and women who use them every day.

This unit was conceived to possess the same level of reliability and effectiveness required by the pros. It's the next best thing after a fire truck.



www.waterax.com

WATERAX
WE MOVE WATER

Westex by Milliken

Booth 202

At Westex by Milliken, we go "all in" when it comes to worker safety. We are leaders in secondary arc-rated (AR) and flame resistant (FR) protection backed by 150 years of Milliken innovation. Our community of innovators has developed one of the largest collections of patents held by a private company.

Westex by Milliken creates an unprecedented ability to provide the most innovative fabrics for the millions of global industrial workers who require durable protection from arc flash, flash fire and other thermal hazards. Our fabrics are all made in U.S. manufacturing facilities and the acquisition of Springfield, LLC by Milliken & Co. means an unmatched amount of FR expertise – all in one place.

At Westex by Milliken, we believe that science is the key to FR safety. Ultimately, what matters most is not how the FR engineering is done, it's that the FR engineering is done and is guaranteed for the life of the garment.

Westex by Milliken's complete portfolio of AR/FR fabrics includes our market-proven lines: Indura®, UltraSoft®, and UltraSoft AC® plus fabrics new to our offering, including: Westex Synergy®, made with 100% Nomex® IIIA, and Westex® DH. These brands are specified by many end users globally in the utilities, electrical maintenance, oil and gas, and metals industries because of their proven track record of providing an excellent balance of protection, comfort and value.

www.westex.com

SEE THE CLARITY.
900
600
300
368 F
Bullard
X FACTOR
THERMAL IMAGERS
UPGRADE
Upgrade your Bullard TI at an affordable price
TRADE-IN
Get credit for trading in Bullard and other TIs
5-YEAR WARRANTY
5-year full TI warranty
Bullard®
Learn more at www.bullard.com/xfactor

Fire Services of Macao SAR, China

Macao consists of Macao Peninsula, Taipa Island and Coloane Island. It became a Special Administrative Region of the People's Republic of China on 20th December 1999. It covers an area of about 30 square kilometers with a population of 646,800 people. In 2009, the Macao SAR Government was able to lease an area of 1.09 square kilometers of Hengqin Island from the Chinese Central Government to pave way for the long-term development of the University of Macau.

Neil Bibby

Since the establishment of Macao Special Administrative Region, Macao has achieved rapid social and economic development. The city boasts a diversity of tourist attractions, such as the Historic Centre of Macao inscribed on the UNESCO's World Heritage List in 2005. In addition, many large-scale international events are held in Macao annually to allow visitors to experience wealth of entertainment in the city, such as Macao Grand Prix, Parade through Macao, Latin City", Macao International Fireworks Display Contest, etc. As a meeting point of Eastern and Western cultures, Macao attracted over 30 million visitors in 2015.

Fire Services is an emergency unit which provides a wide range of fire and rescue services due to hazards, including fire, flood and building collapse. The Fire Services is also responsible for ambulance service and fire-fighting coverage for the airport in the city. With 1589 recruit quotas, the Fire Services is staffed by well-trained fire personnel from senior commanders to firefighters.

There are eight fire stations, including two airport fire stations, which are equipped with around 200 fire appliances in Macao. To cope with the future development of the society, additional potential sites are going to be developed in the near future.

In 2015, the Fire Services responds to around 41,000 emergency calls for ambulance service, together with around 1000 fire calls. The performance pledge of the Fire Services is to activate emergency response within one minute after receiving an emergency call and to arrive on the scene within six minutes during normal traffic flow. The performance target is to achieve the above graded response times in 95 per cent of all calls. In fact, the Fire Services meets the performance pledge in 99 per cent of all calls.

Fire Prevention is the top priority of the Fire Services. In line with the policy objective targeted in the area of public security, "To be responsible to the people, to work in closer partnership with the community and enhance public relations", the Fire Services is committed to strengthening communication with citizens, schools and community to enhance fire safety awareness of the public. The Fire Services organizes various promotional and educational activities on fire prevention on a regular basis with the aim of reducing fire risk and occurrence of emergency incidents, such as fire safety talks, evacuation drills and practical training on proper operation of fire extinguisher. In 2015, through extensive publicity conducted by the Fire Services, the occurrence of fire accidents dropped by 12.9 per cent, which mainly included burning joss paper and forgetting to switch off cooking appliances etc. The reducing number of fire accidents has shown that the fire safety alertness of the public has increased.

Fire Services Museum is one of the not-to-be missed destinations for visitors in Macao. The museum is located in a fire station built in 1920s in the Macao Peninsula, housing more than 700 exhibits in two halls, which include Chinese and British pumpers used in the old days, fire services uniforms, fire and rescue equipment, as well as displaying information about the history of the Fire Services over the past 133 years.

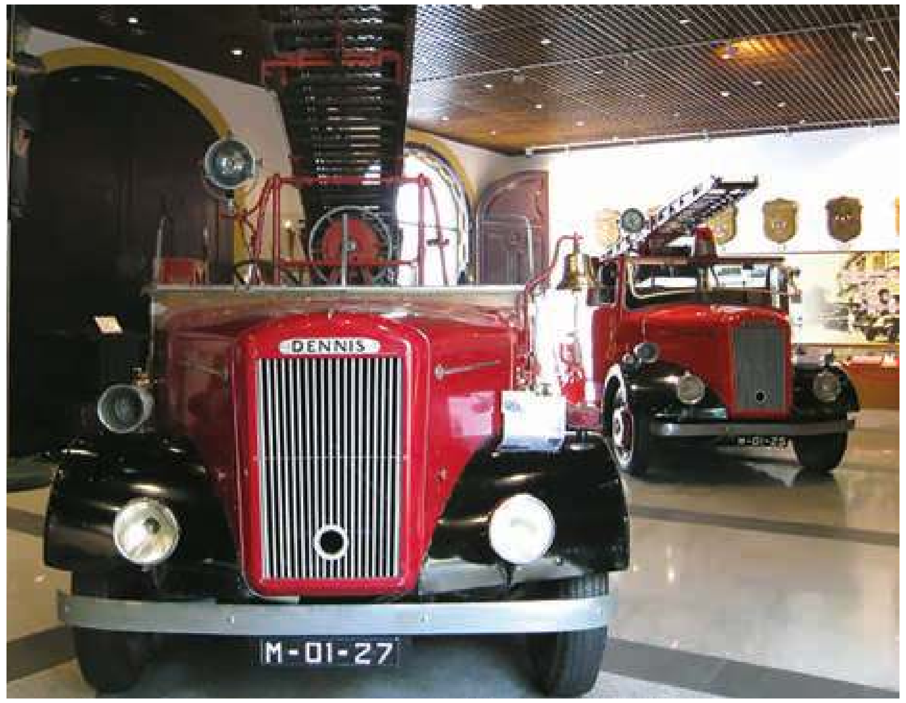
For more information, go to www.fsm.gov.mo/cb/

▼ Fire Officers distribute the fire prevention leaflets to the citizens.

Image courtesy of Tetracom

▶ Fire Officers distribute the fire prevention posters to the caretakers.

▼ Exhibition of the Chinese and British pumpers used in the old days.



▼ There are more than 700 exhibits in the Museum.

Neil Bibby is the editor of *Asia Pacific Fire* magazine.

Mass decontamination in a public setting – making privacy a priority

You respond to an unknown chemical emergency at a high school gymnasium. When you arrive on the scene, you are confronted with multiple victims who have signs and symptoms of a chemical exposure. Approximately fifteen victims presenting with blurry vision, watery eyes, runny nose, and nausea approach you. One of the victims reports that the chemical smells like a greenhouse or a lawn and garden store, and another victim says it has a pesticide odor. There are reports of additional victims inside. Initial estimates are 800 – 1,000 people in attendance of the Friday night basketball game. You have a good reason to believe this could be an intentional chemical release, maybe a high school prank gone wrong, or worse, an international terrorism event.

John Turner

John Turner MS.Ed. is a 28 year veteran with the Wichita Fire Department currently serving as a Battalion Chief. He has been a National Fire Academy Instructor and a hazardous materials technician for most of his career. He holds a masters degree in education and is the lead instructor at DQE, Inc. serving in their decontamination programs for over 15 years.

There are a multitude of command and control functions that have to occur: rescue, treatment of victims, and decontamination considerations. Control of the overall scene is going to be difficult but will eventually occur with the help of local law enforcement. Having an account for all those in attendance and those who have left the property is impossible. You set up a treatment/transport area and send a search team in for the remaining victims. You have the dispatcher notify area hospitals of victims who maybe en route in private vehicles.

How are you going to address decontaminating multiple patients and keep your crews safe from a secondary exposure? Your last decontamination training for a multi-casualty event consisted of master streams at a low

▼ **Chemical exposure victims, wearing their privacy garments, stand in a triage area while waiting for further decontamination instruction.**

Image courtesy of DQE

▼ **The Doff-it® Personal Privacy Kit contains a privacy garment, collection bag for contaminated clothing, clear sealable bag for valuables, foot covers, moist towelettes, paper towel, and pen.**

pressure fog, either positioning the discharges from engine companies to spray potential victims, or a stream from a ladder pipe. People from the same local high school drama club were recruited to play the role of victims during your disaster exercises, and they all went through a gross decontamination process with large gallonage fire streams. The training exercises were conducted in the warm weather with the victims being clothed in a swimming suit, or shorts and a t-shirt. Going back to our scenario with dozens if not hundreds of people in need of decontamination, how easy is it going to be if the ambient temperature is 40 degrees, and a wide age range of victims with varying degrees of baseline clinical condition?

A water temperature at 68 degrees is going to be uncomfortable enough that victims will not tolerate a shower for very long. With tap water approximately 50 degrees and low ambient temperatures, suddenly throwing water on them could increase a victim's heart rate and blood pressure, resulting in a heart attack to someone who is vulnerable. Most contamination is on the victims' clothes. To have victims go through a decontamination shower with their clothes on could possibly spread the contamination.

How about getting the victims' clothing off? If the majority of the contamination is on the victims' clothes, it's believed we can remove 75% – 90% of the containment just by stripping off the clothing. Stripping conscious victims of their clothes is going to be a difficult situation. Lawsuits for not providing adequate enough privacy during decontamination have been won against fire departments.

What are your options? How can you safely treat and transport these victims without becoming symptomatic as well? While 85 degree water is considered the ideal, it's not possible for most fire departments to deliver without specially designed units or heaters. The first step to the decontamination process is to remove the victim from the area of contamination; fortunately, most ambulatory victims remove themselves before our arrival. The second step, and often times the most important step, is to get the victims' clothes off, and the final step is a soap and warm water decontamination shower.

Providing for privacy can be a difficult challenge. Holding up blankets may not fully cover the victim and allows the firefighters too close to the victim. Setting up screens doesn't provide privacy around taller buildings and can be difficult in the wind. Allowing the victim inside of a building to change contaminates the building, and in addition, being inside an enclosed area accumulates vapors. The best and quickest method of getting patients out of their clothes, thus providing a very important step of the process, is the decontamination Doff-it® Personal Privacy Kit.

The Doff-it Kit has everything you need for patient privacy and also allows the patient to contain their own clothing, which is often times the worst of the contamination. Inside a personal privacy kit is a large poncho that the patient slips on once they take their outer layer of clothing off, such as jackets and sweatshirts. Once the gown is slipped on, the patient will take their shirt off first while maintaining privacy. Once they disrobe their shirt, the pants will come off next. Taking the shirt off first allows the patient to not worry about the gown riding up and exposing themselves. Once the clothes are off, the victim has two bags: one for their clothes, and the other for valuables, such as keys and cell phones. At this point we don't need to decide what gets returned, but if items do get returned, having the non-porous items such as keys and cell phones in a separate bag will be helpful.

Looking at the scenario again with the availability of Doff-it Kits, the ambulatory victims can be quickly sent to a triage area outside the building. For those victims who don't have liquid or solid contamination, we can quickly get them into a personal privacy kit and transport immediately. For those victims who have a liquid or solid contamination, we need to find a way to give a soap and water decontamination shower, and we can start with clothing removal easily. Very few victims will actually be contaminated with a liquid or solid substance, but for those who are, we can concentrate our efforts and try to come up with another solution other than using cold fire streams.

Doff-it Kits can easily be stored in a small amount of space and can be self-administered by most patients. It's the quickest and most practical method of conducting a mass decontamination while providing for privacy and keeping firefighters at a safe distance.

For more information, go to www.dqeready.com/HazmatVictimCare

WHEN IT COMES TO DECONTAMINATION, DQE HAS YOU COVERED.

Easy Ways to Decon
Choose your perfect decon equipment.

DQE carries a full line of decontamination shower systems and accessories to fit your needs. No matter what the size or circumstance of an incident, we're confident that you will find your perfect decon gear with DQE.

For over 20 years, DQE has been providing our line of practical decontamination products throughout the world. Our products are built to last, so they will be ready during HazMat training and response events.

DQE equipment makes Decon Quick & Easy.

Contact us at info@dqeready.com for details on becoming a distributor.

DQE
Ready now for what's next.™

www.dqeready.com | 800-355-4628

SAPHIRE CREATORS OF TRAINING HARDWARE

Gas and wood-fired training facilities - Hybrid training - Flashover unit - Nozzle unit - Emission control - STCW 2010 & Offshore/ Maritime training facilities

SAPHIRE-CTC is building up a global reputation as a valued developer and manufacturer of standard and XpertBuild training modules. One of SAPHIRE-CTC's unique characteristics is that it offers services to a range of industries including the world of fire-fighting, renewable energy industry and the offshore- and maritime industry. Visit our website to view our range of products and services.

Nozzle- Flashover-unit, Royal Netherlands Navy NL
ETU, Istanbul Fire Department TR
Live fire building, Oefencentrum Crailo NL

START SAVING LIVES
SAPHIRE Complete Training Concepts

WWW.SAPHIRE-CTC.COM

Collaboratively managing our aerial firefighting resources

The reality of firefighting is that it is a complex science. Now more than ever aerial operations are needed to assist resources on the ground. The National Aerial Firefighting Centre (NAFC) supports aerial firefighting capabilities through its collaborative approach to resource management.

Freya Jones

Since its formation in 2003, NAFC has facilitated the sharing of crucial aerial firefighting resources between Australian states and territories. Its core role involves coordinating lease agreements and contracting a national fleet of highly specialised aircraft that emergency services and land management agencies across Australia rely upon during the fire season. While aerial firefighting on its own is not normally effective in extinguishing fires, when deployed in cooperation with on-the-ground firefighters it can prove vital.

As well as providing important aerial support during fires, the fleet of aircraft is able to offer operational support for a range of other natural hazards, such as flood and storm mitigation and recovery activities.

The fleet of specialised firefighting aircraft are sourced by NAFC on a lease basis from high quality operators around the world and a public tender process is used to manage aircraft procurement. State and territory experts conduct extensive risk assessments prior to and during the fire season to determine how aircraft are best positioned across the country. The growing trend towards longer fire seasons has at times posed a challenge for NAFC in managing resources, with many of the larger aircraft coming from overseas for the fire season.

Due to the cost of these highly specialised aircraft it is not economically feasible for every state and territory to host the full range of aerial capabilities during the fire season. Instead NAFC fosters a national arrangement between all jurisdictions which allows aircraft to be readily shifted across the country as high risk fire conditions develop. By facilitating the sharing of these aerial resources agencies are provided with increased capacity to respond to fires and valuable access to aerial support that would otherwise be unavailable.

General Manager of NAFC, Richard Alder says the organisation works closely with its members, made up of Australia's firefighting agencies from all states and territories, to best meet everyone's needs.

"It is a complex map of stakeholders and I am proud of the work the NAFC team does to deliver better support to our Members."

The current fleet of more than 120 aircraft includes large helicopters (such as the well-known Aircrane), fixed-wing firebombers and water scoopers, among other specialised aircraft – the 2015/2016 fleet also included four large fixed-wing airtankers. It is early days for large airtankers in Australia but they could prove to be a game-changer in aerial firefighting. The sophisticated large airtankers offer speed and flexibility that allows them to deploy quickly across the country and operate within several jurisdictions during the one day. Not all aircraft are effective in every situation, and for this reason NAFC procures and maintains a mix of specialised aircraft to provide the flexibility agencies need to respond to a wide range of events.

NAFC's highly cooperative model has seen contracting of aircraft transition from a state-based responsibility to a centralised system, made possible with the support of the Australian Government. In 2015-2016 the Australian Government provided $15.38m in essential funding towards the standing costs of the fleet, with state and territory governments meeting operating costs and the remaining fixed costs.

"Without the support of all levels of government, both tangible and intangible, NAFC could not operate," says Mr Alder.

Mr Alder says the successful model has been instrumental in supporting fire, emergency services and land management agencies and, most importantly, in saving lives and property throughout many bushfire seasons and emergency situations.

"The sophisticated way in which the fleet is moved around the country is a reflection of the collaborative approach and the goodwill shown by all. We have come a long way in a short time."

Enter 'ARENA': A comprehensive support system for aerial resources

A major milestone for NAFC has been the creation and implementation of ARENA; a collaborative national information system to support the management of fire and emergency aviation. The first stage of ARENA was rolled out during 2015 and provides users with a national registry of aircraft, operators and people.

The ground-breaking and innovative system was developed in conjunction with NAFC's members and delivers convenient access to a single source of consistent, quality-managed information. ARENA engages cloud-based architecture which provides users access to information from a range of devices and locations.

Mr Alder says the system offers a unique opportunity for the industry.

"In practice, the collaborative approach to ARENA will deliver a cohesive, integrated national information system that all our stakeholders can use to help with effective and efficient application of aviation resources across the country"

Since its release ARENA has clocked up over 1,100 registered users and now records the details of more than 550 aircraft, 950 pilots and 180 aircraft operators.

ARENA reduces administrative business processes and streamlines communication between all stakeholders. Providing one tool for all jurisdictions the system maintains high quality data on the movement of the fleet and the operators and pilots.

Perhaps one of the most important features of ARENA is its ability to integrate data from a range of other systems including existing agency information management systems. Many additional functions for the system are currently being developed, such as daily service readiness, resource availability and fleet preparedness.

NAFC is committed to the ongoing development of ARENA – as its functionality and user numbers grow its value to the sector will continue to drive efficiencies, collaboration and positive outcomes for Australian communities.

For more information, go to
www.nafc.org.au
arena.nafc.org.au

Freya Jones is Communications Assistant for AFAC.

Aircraft are called to survey and fight firefronts too dangerous for ground crews.

Image courtesy of Wayne Rigg, CFA

Hello, Emergency Services – why do you need recording solutions?

Selecting the right voice and data recording system is vital for the successful management of any organisation that interacts with the public by telephone and is often a fundamental part of any quality system. For the Emergency Services, however, the importance of voice and data recording cannot be over-estimated.

Stuart Munro

Stuart Munro is Regional Sales Manager for Australia and New Zealand for Red Box Recorders.

Every day call handlers within the Emergency Services sector are dealing with highly complicated call scenarios, often with life or death implications. Furthermore, they are under huge pressure to perform in a highly regulated environment, with limited resources and budget. Having the right voice and data recording solution in place will support the organisation's operational needs, improve efficiency, increase positive outcomes and avoid any additional IT burden.

When selecting a recording solution, any supplier you choose must have an in-depth understanding of the specialist, mission-critical needs of the Emergency Services. In addition to operational requirements, aspects such as reliability, lifetime costs and ongoing IT involvement must be taken into consideration. Most importantly, for organisations that are responsible for protecting the public, the recording of voice and data is key for both surveillance and building fast, effective resolution procedures.

Storing and searching data

A key consideration when selecting a recording solution is how data is stored and managed. The Emergency Services are required to store all the audio and associated metadata for every call, so that evidence can be located quickly and will correlate with other points of reference. This makes the storage and ongoing maintenance of stored data critical to a voice and data recording solution.

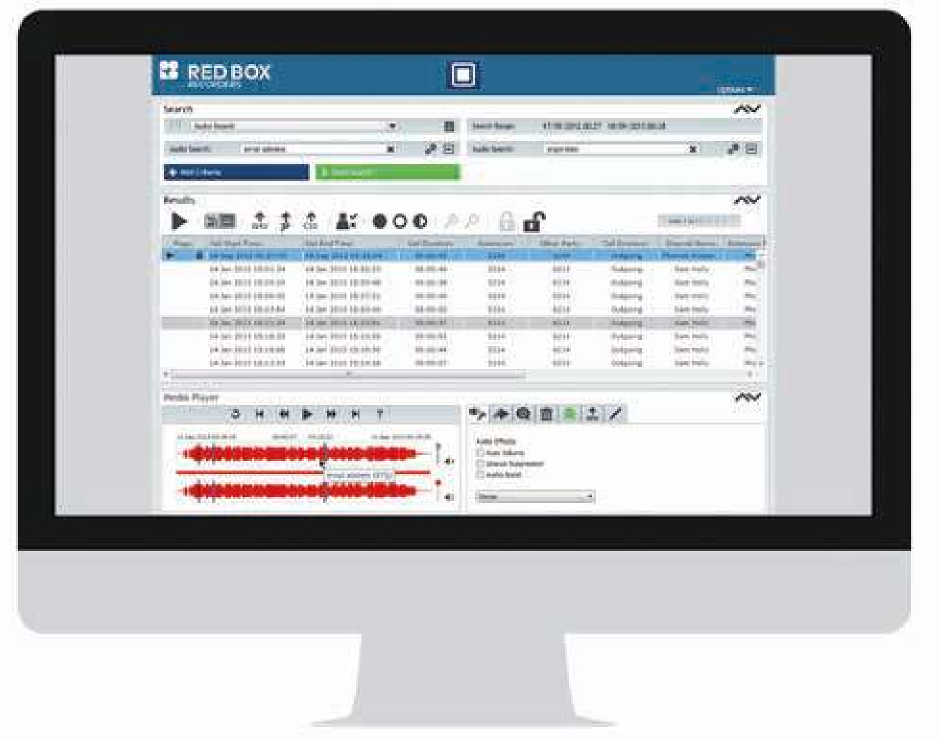
One approach is the storage of records in two separate locations, for example audio on hard disk, with a centralised database for the metadata. The problem with this approach is that both sets of data need to be backed up and both have to be restored when a requirement arises. Inevitably this requires IT involvement and is extremely time consuming. There is also the danger of essential reference materials being lost, making it extremely difficult to find the required recordings.

It is far preferable to deploy a recording solution that stores audio and metadata in the same location, with a built-in archive and backup process to manage the content and a restore process that can be handled by the system user without involvement from IT.

▼ For personnel in the field, resilient systems are critical.

Image courtesy of Red Box Recorders

▶ One single search and replay screen for radios, phones or consoles helps.



This is especially important when you consider that an ambulance authority may need to keep its data for a period in excess of 21 years.

A future-proof solution

The ability to find calls quickly and accurately is absolutely essential. It's also important for the data to be easily migrated – for example to other storage systems – as simply as possible.

The potential problems here are obvious: over time there are likely to have been numerous infrastructure changes (upgrades to phone systems, migration to VoIP, change of operator identification, CRM updates, regionalisation and naming convention changes), plus the need to increase storage volumes, migrate to other storage technologies etc.

Organisations should ensure that the solution they choose is able to manage ongoing changes and allows for easy data migration, hardware updates and developments in technology. Above all, the chosen solution must guarantee that the recordings already made remain safe and offer integrity of the data so that any changes to configuration are not inflicted on historical data. Many systems are unable to prevent this, causing major problems for evidential disclosure.

Authentication of data

All evidence presented requires the originality of the recording to be proven, to prevent tampering or misrepresentation of evidence. To this end, any proposed solution should provide 'authentication' – in other words, digital watermarking – of all recordings made at the point of capture. It is advisable to check that it is provided as standard as part of the solution.

Reasons to record

Emergency Services have an operational requirement to record and store all emergency and non-emergency calls for a number of reasons:

1. Evidence – Any communication with the emergency services can be called as evidence in investigations and criminal cases. This means that the clarity and integrity of the recordings is essential.
2. Disclosure – Anyone who calls an Emergency Service is recorded and these recordings are regularly used to clarify what was said, when, by whom and how.
3. Protection and dispute avoidance/resolution – Protecting your organisation's interests by proving 'who said what' in a dispute can be vital, saving time, money and credibility. The Emergency Services have a high level of complaints, with potentially serious implications for the organisation and its staff members.
4. Staff training and development – Recording and monitoring calls is one of the best ways of capturing interaction information for the effective coaching of staff on call handling ability, operational knowledge and soft skills. This is often used as part of the staff development and accreditation programme internally.
5. Compliance – There are many strict policies and procedures regarding the management of emergency service calls. As a result, staff need to understand and intelligently apply learning to challenging call scenarios that may range from abusive callers, hoax callers and silent calls to potential suicides and dire emergencies.

Simplifying the technology

In the past, traditional voice and data recording systems have been technology-heavy and have required considerable involvement from IT departments. This is bad news for the majority of public sector organisations relying on ever-shrinking IT departments that are already massively overstretched. Voice and data recording technology is so niche that most IT managers will be against investing time and money in 'understanding the technology'. Rightly so – any technology that requires a lot of manual intervention brings with it time and cost implications.

You should use a system that offers a single, software-based solution that can be implemented in a modular fashion to meet a range of requirements, which provides excellent budgetary control. It is completely web-based for ease of use and fast rollout, and it has been designed in such a way that it can be managed by operational personnel rather than IT specialists. Customers can use their own hardware and operating system to maximise buying power if they prefer, or they can opt for full turnkey systems for simplicity of procurement and support.

Image courtesy of Red Box Recorders

▲ **Event Reconstruct: Place important communications into a custom workplace for evaluation.**

Another consideration is the number of servers that are needed for the solution and the resulting effect this has on power consumption, heat and environmental impact, plus the complexity it adds to issues such as backup, support and maintenance.

Scaling the system

As with all new capital investment it is important that any solution chosen is as future-proof as possible. Scalability is a must, as your system needs to be able to grow with your organisation and allow for changes of interface as your telephony and radio systems evolve.

The solution should also enable you to add new functionality – for example, Audio Analytics, Quality Management or Screen Recording – as and when you need it. This flexibility will allow you to meet the operational requirements of the different functions across the organisation, with the same core investment.

Future concerns are generally around convergence and the ability to offer evidence based on all types of media – including audio, video, data and GPS – as a single reconstruction for evidential disclosure. For most organisations this is currently a step too far and, in the present economic climate, the cost implications of developing their offerings around this area may be prohibitive.

Final considerations

Whatever your requirements, it is paramount that you choose a reliable and resilient solution that meets the operational needs of your specific service. It should provide total recording across all communications, with instant replay for caller detail verification and fast evidence output and distribution. Ideally find a solution that not only records all communications – telephony, radio, TETRA, Airwave and IP devices – but also integrates with command and control systems (ICCS) to offer additional details relating to radio ID, talk groups and full ISSI information.

And a last word: bearing in mind that the system is largely going to be managed by operational personnel rather than IT specialists, it is important that you partner with a supplier whose solution is intuitive and easy to use, and one which offers comprehensive training coupled with responsive and solid customer support. For those working in the highly pressured Emergency Services sector nothing should be left to chance.

Leading Voice and Data Recorder Provider – Addcom Contact Solutions

ADDCOM Contact Solutions (ADDCOM) has been a key player within the voice and data recording industry in Australia and New Zealand for over ten years.

ADDCOM serves the recording needs of emergency service agencies from a range of sectors including Government Agencies, Public Safety, Security Monitoring, Contact Centres, Rail, to Energy and Financial Institutions covering from one to over forty sites with a central database.

Key Australian clients include Ambulance Victoria, Tasmanian Ambulance, NSW Fire and Rescue, NSW Police, Airservices Australia and NSW Rural Fire Service as well as a number of agencies within New Zealand's Emergency Services sector.

For more information, go to
www.addcom.com
www.redboxrecorders.com/apac/

QUALITY – MADE BY ZIEGLER –

TECHNOLOGY IS SECURITY.

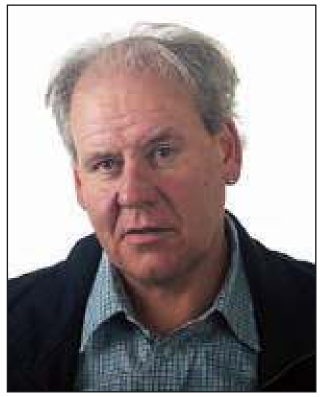
With the Z-Class we supply extremely high performance for airport fire fighting and rescue vehicles. A modular concept enables the configuration of 4 x 4 to 8 x 8-vehicles. The vehicle size, the quantities of extinguishing agents, as well as special superstructures and components of the Z-Class fully meet the manifold tactical mission requirements. Especially with the High Reach Extendable Turret Z-Attack ZIEGLER offers a maximum of technology.

www.ziegler.de

Ziegler

Remote access puts your fire system at your fingertips

Managing a large or complex facility becomes a lot easier if you can get the right information at the right time, in the right place. Today's fire indicating panels collect and organise tremendous amounts of real-time information that could be very useful during a fire alarm incident: If it were available on a truly portable device such as a smartphone or tablet.



Kevin Cudby

Kevin Cudby has been working in commercial research and development since 1982. After 14 years as a freelance technologist and journalist, Mr. Cudby joined Pertronic Industries in January 2016 as Marketing Services Manager.

Buildings are getting bigger. Urban developers pack entire villages into residential or commercial skyscrapers dozens of stories high. The latest shopping centres and hospitals have tens of thousands of square metres under one roof. Universities sprawl over vast areas or crowd into large-footprint buildings as big as suburban shopping centres.

Protecting the occupants of these vast 21st century facilities is no trivial task. Their fire alarm systems often have multiple control panels and thousands of individual sensors. Advanced fire indicating panels are state of the art computer systems which are very good at storing and presenting large amounts of information in a user-friendly format.

The stakes are high. A fire in one of these huge complexes puts hundreds, sometimes thousands, of people at risk. Unwanted alarms are common. Unnecessary fire brigade callouts cost thousands of dollars in callout fees.

The best fire systems make it easy to track the development of fire alarm incidents. In theory they provide a wealth of information that helps facility managers quickly establish whether they are dealing with a real fire or a nuisance alarm. But there is one catch: Fire indicating panels are not portable.

Many facility managers could use a fire system that runs on a mobile device such as a smartphone or tablet. A quick, easy, and very effective way to achieve that is to use remote access software such as TeamViewer. This software links a PC-connected fire system to the mobile device.

There are two practical ways to implement a remote access system.

▼ TeamViewer allows remote control and monitoring of fire graphics systems such as Pertronic FireMap.

Image courtesy of Pertronic Industries

Image courtesy of Pertronic Industries

▲ The fire indicating system at Brisbane's Lady Cilento Children's Hospital includes nine Pertronic analogue addressable fire indicating panels and three FireMap workstations monitoring 580 fire zones.

Fire Graphics Systems

The first option is to use a fire graphics system such as Pertronic FireMap. When used with a Pertronic intelligent fire indicating panel, FireMap displays the location and status of each fire sensor on a set of maps or floorplans of the facility. Each sensor is represented as a coloured icon: The colour indicates the status, for example, red for alarm.

A graphics system such as FireMap allows a facility owner or manager to supervise their fire system from any internet-connected location. Many FireMap users report that the graphics system allows them to significantly reduce the incidence of unwanted alarms. Candles on a birthday cake lit up too close to a smoke detector, for example, may trigger a smoke sensor. In a case like this the facility manager usually has only a few minutes to prevent an expensive unnecessary fire brigade callout. The graphics system helps to quickly find the problem. If it's a false alarm they can prevent the fire brigade callout: If it's a real fire, they're in a good position to make sure everyone gets out safely. Firefighters also appreciate quick access to information from the graphics system because it makes their job easier, safer, and more effective.

On many sites, remote access brings out the fire graphics system's full potential. With a traditional FireMap workstation, a facility manager can check the status of multiple fire sensors at a single glance. But without mobile access they will not know if the system's status has changed since they last checked the FireMap workstation, which may be hundreds of metres away from the source of the alarm.

If the information is available on a smartphone or tablet, the building manager can watch the progress of an incident as they move around the facility. If a smoke alarm happens to be a side-effect of a birthday party, usually only one smoke sensor will report an alarm, and the alarm condition may clear while the facility manager is on their way to investigate. If it's a real fire, the facility manager will see alarm conditions from additional sensors, triggered by events such as the spread of smoke, automatic sprinkler activation, and people activating manual fire call points.

Fire system simulators

A second option is to run a fire system simulator such as Pertronic FireUtils. This application provides the personal computer with full control of the fire indicating panel. The screen displays an image of the fire indicating panel's keyboard and display. Buttons on the fire indicating panel can be pressed by clicking the mouse or tapping the touchscreen. Usually the PC is connected to the fire indicating panel's serial communications port with a USB cable and an appropriate adapter (RS232). TeamViewer software extends the PC's display on to the smartphone or tablet, which makes the simulator accessible from any location with cell-phone coverage.

Engineers, technicians and building managers can use this type of simulator for a variety of purposes. For example, on many large projects the sensor bases

◀ **The Pertronic FireMap system at New Zealand's University of Waikato supervises 55 Pertronic analogue addressable fire indicating panels across a sprawling campus near the city of Hamilton.**

© Image courtesy of Pertronic Industries

are mounted and wired up. The plug-in sensors are installed as late as possible, to prevent dust from construction activities building up inside the sensors.

When it's time to plug in the sensors, technicians can save many hours by using a smartphone or tablet to check each sensor as it is plugged in. An advanced fire indicating panel such as the Pertronic F220 displays sensor information in well-organised, easily accessible lists. A technician using TeamViewer and a fire system simulator can use their smartphone or tablet to check each sensor as they plug it in, making sure it is the correct type, that it is properly plugged in and working normally. Having this information at the technician's fingertips dramatically speeds up installation and commissioning.

An extreme example of the value of remote access was the installation of the fire system at Scott Base, the main Antarctic operations centre for Antarctica New Zealand. The Scott Base electrician installed the system, while engineers from fire alarm supplier FFP Canterbury Ltd. used the panel utility software to check the system and answer technical questions from the comfort of their office and workshop in Christchurch, New Zealand.

Remote access can also simplify routine maintenance such as cleaning smoke sensors. Advanced fire indicating panels can identify sensors that need to be cleaned. A maintenance technician can use their smartphone or tablet to isolate sensors while they are being cleaned, to check them after cleaning, and to reinstate the system when the maintenance work is completed. Having the panel controls available on a smartphone saves a great deal of walking between sensors and fire indicating panel.

Choose the right solution for each project

Using remote access opens the door to a range of practical solutions. Each facility presents unique challenges, which is why fire alarm manufacturers offer a range of options. For example, maintenance technicians may use either a fire system simulator, or a fire graphics application, to isolate smoke sensors for cleaning and testing. The choice depends on the system. At Dunedin Public Hospital in the South Island of New Zealand, for instance, the fire system has nine Pertronic F120A fire indicating panels, together with numerous PC workstations running Pertronic FireMap. The system is maintained by Toby Reynolds, a fire system technician at Tansley Electrical. Mr. Reynolds uses an iPad to control the entire system from anywhere, on or off the hospital campus. Remote access to the FireMap system makes it easier to deal with nuisance alarms. Mr. Reynods also uses his iPad and FireMap during routine maintenance such as smoke sensor cleaning and testing.

Applications such as TeamViewer work equally well on smartphones or tablets. Both fire graphics systems (such as Pertronic FireMap), and panel simulators (such as Pertronic FireUtils) offer big cost savings and rapid access to critical information during real emergencies.

Remote access applications can only ever be as good as the fire indicating panels they supervise and control. Fire graphics applications such as Pertronic FireMap need precise information about the source of each fire system "event", such as an alarm or fault indication from a sensor. FireMap displays a map or floorplan showing the location of every sensor. If the fire indicating panel does not identify the location, FireMap cannot do its job.

A fire system simulator such as Pertronic FireUtils replicates the fire indicating panel's display and keyboard on the screen of a smartphone or tablet. It is the panel's job to organise the information and present it in an easily understood format. No simulator can overcome the limitations of an inferior fire indicating system.

Remote access solutions put meaningful, well-organised information at the facility manager's fingertips: Anywhere, anytime. Whether the system runs on a smartphone or a tablet, these solutions offer real, tangible benefits. Cost savings are often measured in tens of thousands of dollars per year. Many sites achieve significantly improve operational efficiency, thanks to reduced disruption from nuisance alarms.

In a real emergency, access to critical information in real-time can make the difference between life and death.

For more information, go to www.pertronic.com.au

THE MOST EXPERIENCED MANUFACTURER
OF SPECIAL HAZARD FIRE PROTECTION SOLUTIONS

Our team of specialists provides support
to our global distribution network.

JANUS
FIRE SYSTEMS®

Providing the Most Efficient Package For Clean Agent Delivery Systems.

CLEAN AGENT FIRE EXTINGUISHING SYSTEMS • 3M™ NOVEC™ 1230 FIRE PROTECTION FLUID
LOW & HIGH PRESSURE CO2 • ENGINEERED DRY CHEMICAL • FOAM • AIR SAMPLING • ALARM & DETECTION

FM APPROVED UL LISTED +1 219-663-1600 www.janusfiresystems.com

fireray®
The world's most trusted beam

Fireray® 3000 Exd
Flameproof Beam Smoke Detector
- Range 10 - 100 metres
- Contamination compensation
- ATEX approved
- Patented light cancellation technology

ffe
T +44 (0) 1462 444 740
E sales@ffeuk.com
W www.ffeuk.com
0593

Effective fire stopping solutions now better recognised in Asia

In most countries and organisations, the term “fire stopping” refers to a system of penetration seal applications that is usually an integral component of a larger passive fire protection design. Effective fire stopping plays a vital role maintaining the functional integrity of a fire compartment, within walls, ceilings or floors and in conjunction with other passive fire protection applications employed under the overall principles of modern fire compartmentation.

John Cha

John Cha is Regional Technical Manager of Promat Asia Pacific organisation.

The diversity of fire stopping products now available suit a wide range of building designs, penetrations and other functional openings. These include fire resistant collars for pipe and other service penetrations, and various penetration seals for floors, walls and partitions. Most modern fire stopping systems are made of sealant, mortar, cement and other tested and proven intumescent components.

▼ Plastic pipe penetration seal through concrete wall with PROMASEAL® Bulkhead Sealer and PROMASEAL® Retrofit Collar at the New Royal Adelaide Hospital, Australia.

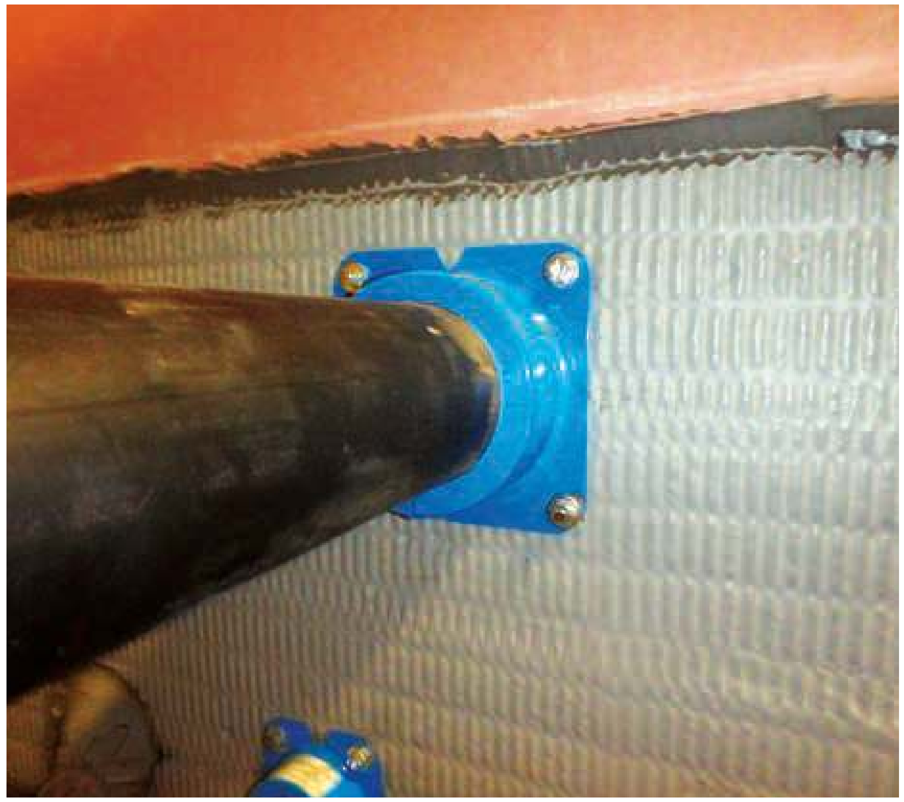


Image courtesy of Promat Asia Pacific

All too often, however, particularly when it comes to actual application, proven fire stopping systems in a building are either taken lightly or overlooked, negating the crucial role fire stopping plays in the event of fire.

Determining the correct fire stopping systems to be used in any given application is rarely easy, especially in view of the architectural and engineering complexities of the modern built environment. Many factors have direct and indirect impact on the decision making process. These include but are not limited to the complexities of design and required build quality of the structure to be protected, likely building usage trends, cost and design considerations, overall and specific awareness of the importance of fire stopping, regulatory environment and building code requirements, and even local approval and enforcement in the local areas surrounding the proposed application.

▶ Structural steel beam cladding protection with PROMATECT®-H matrix engineered mineral boards at the Storhub Self Storage, Changi South, Singapore.

Image courtesy of Promat Asia Pacific

The principal reasons behind the application of fire stopping solutions inevitably run parallel to the application of other and even more holistic passive fire protection systems that are nowadays considered essential to stop the spread of fire and toxic gases and fumes. In the unlikely event of fire, for example, flame and heat should not be able to spread from a fire side to a non-fire side of a fire barrier through any openings, gaps or other weak points present within the fire compartment. Effectively fire stopped, the risk to human life and expensive property is minimised and, equally important, allowing a specified time line for safe evacuation procedures to be realised.

Frequently, however, more developer or building owner attention is focused on other passive fire protection systems, often to the detriment of efficacious fire stopping solutions. This human but short sighted tendency to many potential risks means that the overall passive fire protection system will not achieve its promised fire performance. A typical example is a fire rated partition or ceiling with numerous types of penetrations for mechanical and electrical services such as electrical cabling, cable trays and plastic piping etc. If these are not fire stopped correctly with internationally benchmarked fire stopping systems, fire and toxic fumes will – usually with alarming rapidity – spread to the non-fire side of the fire compartment, sometimes with tragic results.

In fact, the challenges to fire stopping solutions start during product and system development, and how proven test results are interpreted and implemented in the market. Understanding these challenges certainly assist in creating the correct perceptions for passive fire systems generally and specifically for fire stopping applications.

In overall terms, openings through which services penetrate have to be fire stopped in such a manner that the fire resistance of the barrier is not compromised. This means that if a wall or floor has a fire resistance level (FRL) of 120/120/, -/120/120 or even -/120/30, the surrounding area and indeed the entire finished construction must have the same FRL. The only exception is where structural adequacy of penetration seals themselves is not measured. The FRL of the finished seal outlined in the above system would therefore be expressed as -/120/120 or -/120/30.

Around Asia, various fire test standards are observed in the built environment and fire science industries. These are typically British Standards (BS), Australian Standards (AS) and American Standard (ASTM). Some local standards do apply and deviation from most accepted test standards are made to suit the conditions. Further assessments are obtained through recognised test laboratories, when and as necessary.

In fire tests, the temperature on the unexposed side of the specimen is measured at various locations. This temperature is taken not only on the surface of the barrier and fire stopping system but also on the services themselves. If insulation criteria on the services are required, a tested prototype with insulation performance that matches the application is also necessary. The test results must show that the insulation on the services meet the insulation criteria.

Clearly, compliance on fire stopping containing metal penetration is difficult, as temperature will quickly transfer by conduction through the metal elements. Some local building codes may allow waiving of insulation on services where the service is protected such that combustible material cannot be located within 100mm of the penetrating service,

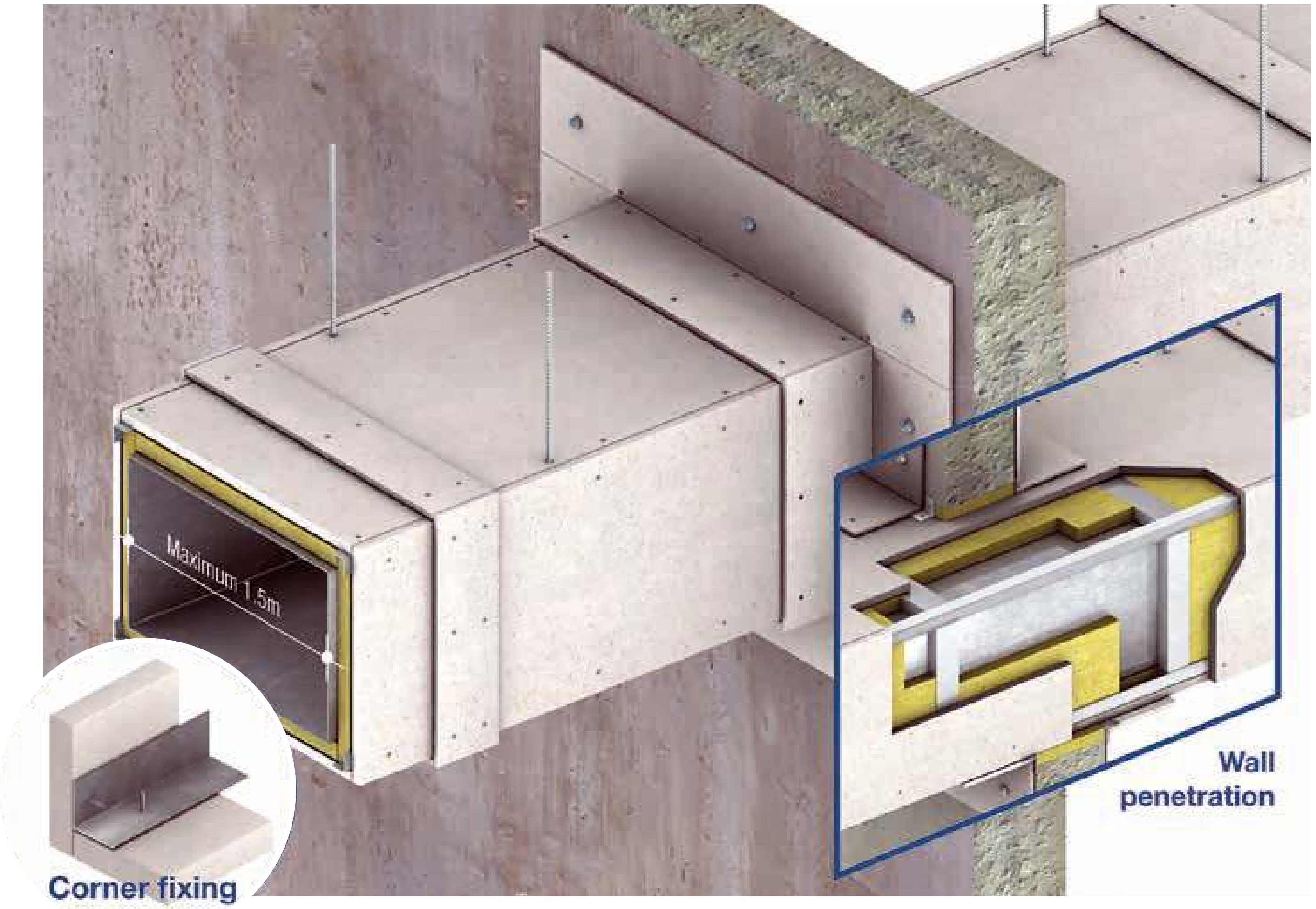


Image courtesy of Promat Asia Pacific

▲ **A typical installation example of cladding to steel ducts not more than 1.5m wide using PROMATECT®-H matrix engineered mineral boards and mineral wool for up to 120/120/120 FRL in accordance with the requirements of BS 476.24 and AS 1530.4 standards**

for a distance of 2m from the penetration, and it is not located within an escape exit.

In some countries, where fire tests are conducted with services penetrating masonry walls, the results may not be applied to drywall construction. Tests on similar and separate construction models are required.

Similarly, where fire tests are conducted with services penetrating drywall constructions, the results may be used in conjunction with all other wall types, provided that certain conditions such the thickness of the wall, the layers of the boards being used, the fire resistance of the wall are met. It is important to note that these have to be evaluated separately by a recognised, registered testing authority.

If the FRL of the separating element of construction through which service penetrations pass is not known, it is a sensible suggestion to state that the fire stopping system will perform for as long as the separating element retains its integrity and insulation, or for as long as the approved FRL of the fire stopping system.

The building owner is also obliged to ensure that their structure being built clearly takes into full consideration the fire safety needs of its occupants. All consultants have the role of specifying clearly the project specifications for the type of fire stopping to be applied and also on the fire resistance according to the local building regulation requirements. The system manufacturer has the role of ensuring that the system is tested according to the relevant test standards and proposing correct application and installation for the recommended solution.

When fire stopping is installed, the contractor must adhere to the system guidelines and installation procedures outlined by manufacturer. If possible a certified installer is tasked to carry out the installation works. Site building inspection must be carried out by all concerned parties to ensure that the specified fire stopping system is installed correctly and will function up to promised performance in a fire event.

In Asia as elsewhere, everyone – from building owners and developers right through to local authorities, project consultants, contractors and fire stopping system application manufacturers – plays a significant role in integrating and installing life and property saving fire science technologies.

Indeed, it is the professional responsibility, dedication and commitment of all stakeholders to ensure that appropriate fire stopping solutions are applied progressively and as comprehensively as possible.

Too much emphasis is sometimes focused on building regulations that enforce the obligatory use of fire stopping systems. On the other hand, there is an increasing body of evidence to suggest that the proper integration of fire stopping systems into an overall, holistic fire protection plan is a positive and ongoing trend in Asia. This is as good for life safety and the protection of the built environment as it is for business and continued long term economic prosperity in general.

For more information, go to www.promat-ap.com

FIRETRACE®
POWER TO INNOVATE. FLEXIBILITY TO ADAPT.

WHATEVER THE HAZARD, WE'VE GOT YOU COVERED

PRE-ENGINEERED SYSTEMS FOR SMALL SPACES:
- Detect and suppress fires automatically
- Reacts 10x faster than conventional systems
- Compatible with most extinguishing agents

UL LISTED FM APPROVED
Listings and approvals vary by agent and system type

ENGINEERED SYSTEMS FOR LARGE SPACES:
- High-pressure performance in a low pressure system
- Unparalleled flexibility in system design and placement
- Cylinder sizes ranging from 35lbs to an industry leading 1300lbs using 3M™ Novec™1230

LEARN MORE AT: www.firetrace.com
A HALMA COMPANY

FIRETRACE INTERNATIONAL - WORLD HEADQUARTERS
8435 N. 90th St., Suite 2, Scottsdale, AZ 85258, USA.
Tel: +1 480 607 1218 • Email: info@firetrace.com

FIRETRACE INTERNATIONAL LTD - EMEA OFFICE
Unit 11, IO Centre, Salbrook Road, Salfords, Surrey, RH1 5DY, UK.
Tel: +44 (0) 1293 780 390 • Email: info@firetrace.com

The social life of policy and planning

Quiet rightly, people in the natural hazards sector hold science in high regard. Scientific research is crucial to predicting and preparing for events where behaviors are unpredictable and where consequences are high. As such, it is unsurprising that government agencies often emphasise their commitment to having 'science-led' policies.

Dr Timothy Neale

Timothy Neale is a researcher at the Bushfire and Natural Hazards CRC and Western Sydney University.

But the routes between science, policy and planning are complex and variable. What is clear is that there is no simple relationship between having 'more' science and 'less' uncertainty, or that more or less of either leads to action (the relationship between scientific research and climate change policy is a prime example of this). I could list dozens of reasons why the interface between science, policy and practice does not run smoothly, but let us focus briefly on two.

First, science is a diverse world of knowledge and as such, it is ripe for debate, whether by scientists, politicians, policy-makers or others. The fact that the research process is open-ended, in which uncertainties can often be reduced but not resolved, means there are often abundant reasons to delay decisions about how to proceed.

Second, there are many obstacles to integrating science within government agencies, not the least of which is resource constraints. Other factors of institutional culture also influence how, and if, new research is utilised.

None of this is anyone's fault – they are simply the conditions in which we operate. In the Scientific Diversity, Scientific Uncertainty and Risk Mitigation Policy and Planning project at the Bushfire and Natural Hazards CRC, the research team is looking at three case studies where scientific knowledge is changing how natural hazard risk is mitigated. The driving questions of the project are about the science, policy and practice interface.

▼ Gamba grass-infested country near Batchelor, Northern Territory, August 2015.

Image courtesy of Timothy Neale

Given that uncertainty is an inherent part of scientific practice and method, for example, how do those engaged in risk mitigation manage these uncertainties in their decision-making? What do practitioners think are the keys to bringing new scientific knowledge in? What else is in play beyond the given technical innovation? We have been very fortunate to find some great partners in the sector interested in understanding more about this space. Our aim is that this project will support the capacity of practitioners to explain and justify what they do to others, whether those others are other risk mitigation professionals, the public, the media, or courts and inquiry processes.

In each case study we begin by interviewing practitioners in the area to understand from them how science and other forms of knowledge inform their work and what they feel are the key issues and uncertainties that they face. We then hold a workshop to discuss these factors using scenario exercises where practitioners are given different scenarios, or predictions, of what the area they work in might be like in 20 years' time.

Understandably, people who work in the natural hazards sector are often focused on the immediate context: what is going to happen this season? What is happening in the community this year? A scenario exercise is a good way to move outside these parameters to think, in this case, about longer trends, how we are going to prepare for these futures and how science can and should inform these preparations.

So far, we have held workshops for two case studies, one in the Barwon–Otway area of south-west Victoria and one in the Greater Darwin area of the Northern Territory.

Victorian case study

To tell you a little about these case studies, let me start in Victoria. For the past several years, the Barwon–Otway area has been the site of a pilot, led by the Department of Environment, Land, Water and Planning, to test an alternative strategy to mitigate bushfire risk. To simplify, the risk-based strategy involves, first, generating loss estimates from suites of bushfires simulated within PHOENIX RapidFire (a 2D bushfire simulator) and, second, comparing asset losses between those suites. This might involve, for example, simulating fires under worst case (i.e. Black Saturday) weather conditions, in which:

1. no planned or unplanned fires have occurred for several decades,
2. all public land has been prescribed burnt, and
3. some accidental fires and some prescribed burning have occurred.

Given the model's ability to predict house losses from the intensity of each fire, the three suites can therefore be compared to reveal the benefit of fire in the landscape and the residual risk that remains.

A more complex arrangement, also trialled, compares multiple asset losses across multiple suites, each comprising thousands of simulations using random ignition and weather scenarios. In short, it is a system for calculating bushfire risk and measuring the benefits (or not) of intervening in the landscape.

Of course, some things fit into modelling better than others. One of the primary drivers of risk management anywhere is reducing losses of human life. But human behaviour – particularly human behaviour in rare and extreme events – does not map well onto algorithms. The practitioners we have met have often stressed the importance of pairing advanced tools such as PHOENIX with professional experience, local knowledge and interpersonal trust.

The Victorian Government has announced that it would be moving to

Image courtesy of Nathan Maddock, Bushfire and Natural Hazards CRC

▲ Gamba grass burns hotter and faster than native grasses and is increasing fuel loads around Darwin. There is a big focus on mitigating the risk, but fires fuelled by gamba are beginning to claim houses and other assets.

Image courtesy of Timothy Neale

▲ Research has examined different burning scenarios around the Otway Ranges in Victoria to assess future bushfire risk.

this risk-based strategy (also known as Bushfire Risk Landscapes) across the state in mid-2016. This is a "brave and positive step," to quote Dr Trent Penman, a bushfire behaviour expert and colleague in the CRC from the University of Melbourne. It moves away from the existing focus on burning a percentage (5%) of public lands each year to reduce the risk to life, property and the environment. The hope of the research team is that our work with fire, land and emergency managers in the Barwon–Otway area will provide some insight into one of the key steps in this policy transformation and the new questions it has raised for practitioners.

Once agencies have a new level of information about where risk lies in the landscape, and the benefit and potential of mitigation, what is the best strategy for passing that information on to the wider public? While, as Eburn and Handmer argue (2012, p. 19), there "is no legal impediment to releasing reasonably accurate hazard information," there are clear disincentives to freely releasing information that is highly complex and has the potential to be reused in negative ways.

Northern Territory case study

The Northern Territory is quite a different case from 'down south', as Territorians often point out, although it also presents interesting parallels in natural hazard management. As part of the tropical savannah, the Greater Darwin area has an annual bushfire season in which approximately 40% of the total area is typically burnt. Every year, as the wet season subsides around April, bushfire practitioners burn off the new grass with the aim of reducing fuel loads during the late dry season.

Unlike 'down south,' this abundance of fire in the landscape is widely accepted as part of Territory life and its environment. However, several trends in the Greater Darwin area are now changing the bushfire risk and its mitigation.

One primary driver in this situation is gamba grass, a pasture species introduced in the 1970s and 1980s that grows into tall, thick and flammable plants if not grazed intensively. Gamba grass is very invasive and has, over the past decade, turned parts of the Greater Darwin area to monoculture, creating high fuel loads that, in the right conditions, produce up to eight times more heat that native grassfires.

Another driver of change is the increased level of subdivision and housing development surrounding Darwin, as areas such as Palmerston and Litchfield take up some of the city's population pressure. Bushfires, previously understood as a minor risk in the Northern Territory, are beginning to claim houses and other assets in the areas infested with gamba grass.

Our work with practitioners has given us a new understanding of how crucial science and practitioners have been to understanding this risk and responding to it through policy and planning. For example, demonstrating the characteristics of gamba grass, tracking its progress, and illustrating its economic and environmental costs have all been necessary in attracting the attention of policy-makers and the public in the Northern Territory, a place in which budgets are routinely strained and fire management is not – for various reasons – a top government priority.

Next case study

Our third and final case study is hoping to draw links between the different contexts we have engaged with. What is clear is that scientific research, whether in a laboratory or a landscape, is never simply technical. Neither is there a single stable entity we might call 'science'; it is instead, as van Kerkhoff and Lebel state (2006, p. 454), "permeable, changeable and contestable". As such, the ways in which decision-makers and practitioners integrate and use science is a thoroughly social question, shaped by the capacities and affordances of the contexts in which they operate. While it is important to continue to place a high value on scientific research in the natural hazards sector, it is also important to remember that this research is embedded in social dynamics and social networks – a 'social life' which we are, at present, only beginning to understand.

For more information, go to www.bnhcrc.com.au

Reference

1. Eburn M and Handmer J. Legal issues and information on natural hazards. Local Government Law Journal. 2012;17: 19–26.

2. van Kerkhoff L and Lebel L. Linking knowledge and action for sustainable development. Annual Review of Environment and Resources 20016; 31: 445–477.

YONE PROEYE 751-SNR

SONAR Plus™

PAT.P

Search out by SONAR and pinpoint with the Underwater Camera Head! Great result in dark and cloudy waters!

With the unique PROEYE 751-SNR SONAR Plus , operators can see sonar images from the SONAR System and real-life images captured by the Underwater Camera Head at the same time. The forefront technologies built into SONAR provides clear images even when searching the dark or cloudy waters of lakes and rivers.

The system is designed compactly for optional use for various types of search & rescue operations.

GPS System indicates exact location on the display.

YONE CORPORATION
www.yone-co.co.jp

23, Nishinakaaicho, Nishinokyo, Nakagyo-Ku, Kyoto, 604-8441 Japan
Tel : +81 75 821 1185 / Fax : +81 75 801 2263

Australian fire app focuses on firefighter safety

The South Australian Country Fire Service (CFS) provides first-line response to rural fires and road accidents across an area of 985,000 square kilometers with 14,500 volunteer firefighters. During 2013 – 2014, CFS responded to 18,115 incidents. That figure has been steadily rising, increasing 38 percent in the past 10 years.

Jeff Perry

When fighting fires, crews are structured in a hierarchical fashion. Strike teams are coordinated by strike team leaders who respond to a sector commander, who in turn, works under the control of an incident commander. The incident commander is ultimately responsible to the state operations center.

CFS uses the UHF South Australian Government Radio Network (GRN) for command and control. The state government recently awarded Motorola a contract to upgrade the network, which comprises about 220 radio sites, from SmartZone technology to the Project 25 (P25) standard. For fireground communications, CFS uses analog VHF radios, predominantly in simplex mode to avoid tying up the GRN trunked network resources.

A separate recent contract awarded to South Australian company Tetracom calls for CFS to implement P25 digital radios and provide enhanced operational efficiencies and firefighter safety using a data application overlaid on its VHF P25 radios.

The application is intended to overcome difficulties with:

▼ Radio is the lifeblood for safety on the fireground.

Image courtesy of Tetracom

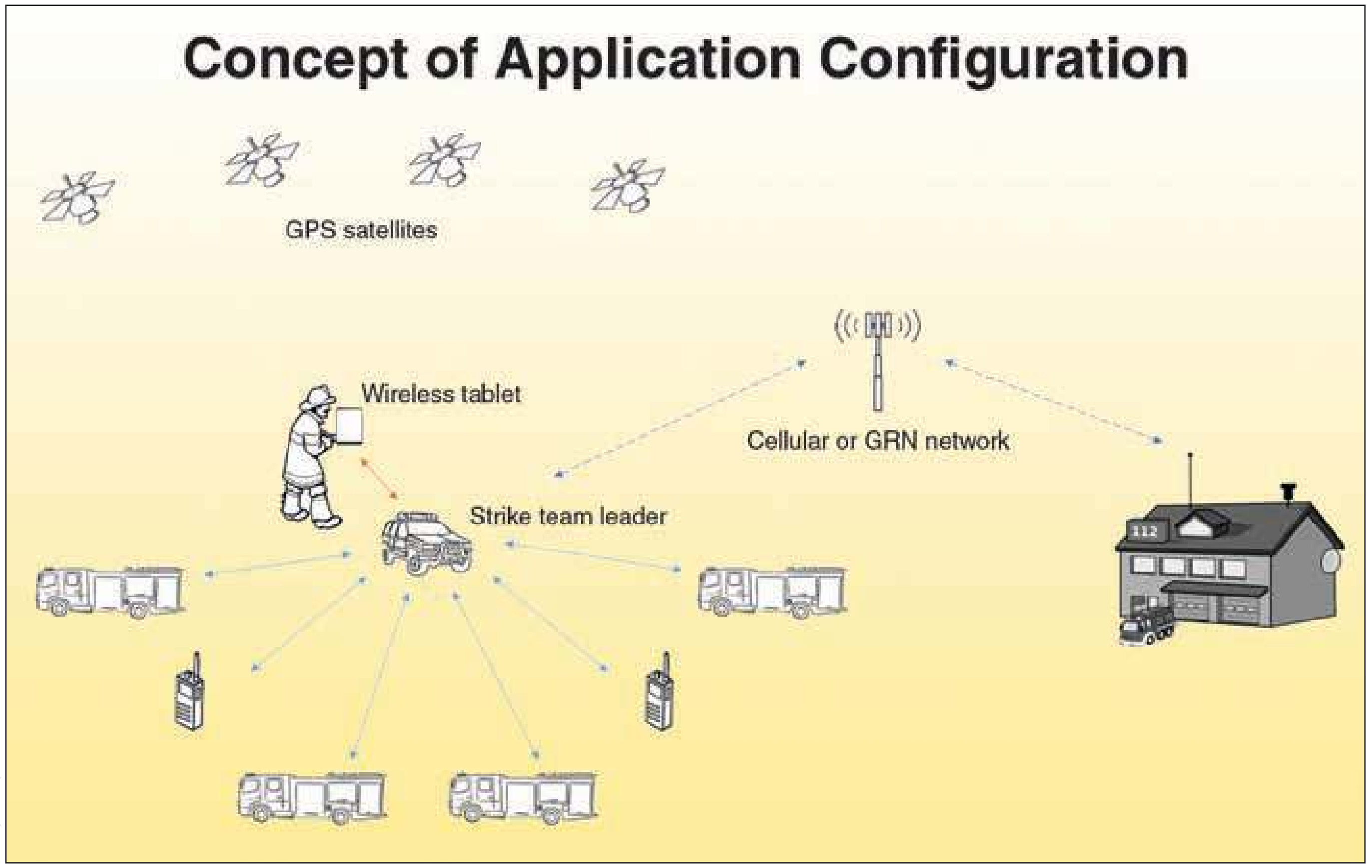


Image courtesy of Tetracom

- Knowing the exact whereabouts of appliances under the strike team leader's control because of obscured visibility from smoke or undulating terrain.
- Maintaining better situational awareness of appliances that may be running low on water, reaching high cabin temperatures or other critical circumstances.
- Managing the best placement of appliances, taking into account the wind direction and fire front information that is available from other sources.
- Responding in the most efficient and timely manner to firefighters who are under duress or in an emergency situation.
- Recalling radio traffic events for post-incident analysis and training.

Proof of Concept

The data application contract calls for a proof of concept for a strike team leader application that will include a topographic mapping interface showing vehicle locations, a track of the fire front, wind direction, key status states such as low water and emergency, radio traffic voice recording and the ability to send text messages. The application will reside on a wireless tablet that communicates with a Wi-Fi gateway in the strike team leader's vehicle. The gateway will interface to the vehicle's P25 radio, which will receive the data sent by appliances that are under the control of the strike team leader. The gateway will also be capable of interfacing to other communications devices, such as cellular modems or GRN radios, to provide access to the information at a remote location if necessary.

For the proof of concept, Tetracom will set up a strike team with all the hardware and most software features implemented so CFS can trial the concept at its training grounds. The application is being developed with the cooperation of critical communications provider Tait Communications, which will provide the fireground P25 equipment, and Omnitronics, which will provide a customized version of its RediTALK Air product along with the Wi-Fi gateway.

Standard P25 status messaging and GPS messages, which are sent from the appliances to the strike team leader's vehicle, will be the signaling used. The user interface will be structured to provide as much information as possible in a simple, clean and uncluttered format so users can easily identify the information needed to efficiently manage their resources.

The map will display vehicle icons using colors to signify each vehicle's status: green for normal operation, yellow for low water indication and red for an emergency/duress state. That simple differentiation will allow the strike team leader to prioritize resources and ensure optimum safety of all personnel.

In another purpose-driven development, Tait will implement software that will enable radios to display the relative position (distance and bearing) of a transmitting radio using P25 GPS information. That feature will be particularly useful in duress situations where strike team members need to locate a nearby team member who may be injured or requires immediate assistance.

The tablet will store audio files holding all voice traffic, enabling CFS to review how crews handled an incident and optimize training processes.

Once implemented, the system will simplify the role of the strike team leader and allow use of P25 technology to better manage the task of coordinating personnel and resources. That will result in more efficient, safer operations while operating on the fireground.

For more information, go to www.tetracom.com.au

Jeff Perry is managing director of Tetracom. He has more than 35 years of experience in the communications industry and is the current convener of the Australian Radio Communications Industry Association (ARCIA) accreditation committee. Email comments to jperry@tetracom.com.au.

This article has been reprinted with permission from *RadioResource International*, Quarter 3, 2015. Copyright 2015. *RadioResource International* magazine delivers wireless voice and data solutions for mobile and remote mission-critical operations.

PERFORMANCE ADVANTAGE COMPANY

TOOL MOUNTING PERFORMANCE ADVANTAGE COMPANY PAC SYSTEMS

"What do you do with one of your best selling, and best performing products?"

WE MAKE IT EVEN BETTER!!

NEW ITEM

PAC's NEW TOOLOK HD

- Wider mounting base for increased stability
- Strength enhanced base material for more durability
- Thicker walled locking strap for more strength.
- PAC's Life Time Warranty!!
- Tested & Certified NFPA 1901 Compliant

PACTOOLMOUNTS.COM

Or give us a call at; 888-514-0083 for more informtion

Ebola 2013-2016 – how long will the memory last?

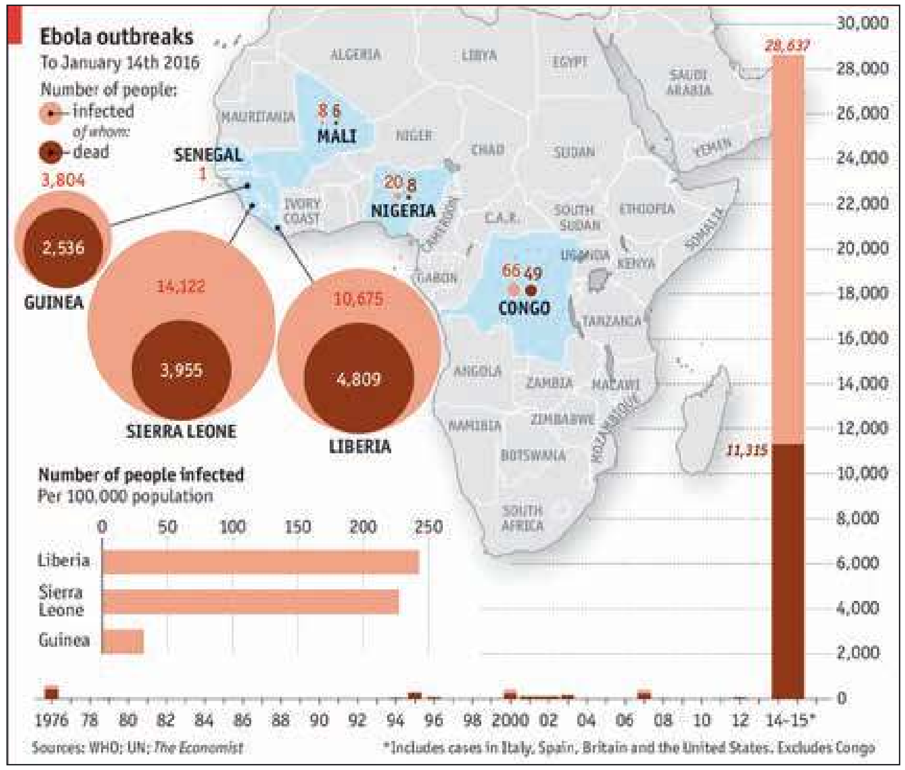
All of the three countries – Guinea, Liberia and Sierra Leone – most affected by the prolonged outbreak of Ebola virus disease have been recently declared "free of Ebola transmission" and, on March 29th the WHO Director-General declared the end of the Public Health Emergency of International Concern regarding the Ebola virus disease outbreak in West Africa.

Professor Lyn Gilbert

This does not necessarily mean the outbreak is completely over; all three countries are still under enhanced surveillance from the (most recent) date that they were declared free of transmission. In Liberia, this first happened in May 2015, but a small cluster of cases occurred in June, linked to a survivor who had continued to shed Ebolavirus in his semen. After a second declaration in September there was another small outbreak (3 cases) two months later and the country was declared free of transmission a third time, in January. Sierra Leone was declared free in November but there were two related cases in January and nearly 150 contacts who had attended the "unsafe" burial of one victim remain in quarantine or under observation. Finally, Guinea, where the outbreak began, was declared free of Ebola transmission on December 29th. However, in the last 2 weeks of March, 5 confirmed and 3 probable cases were reported, most of whom were high-risk contacts of earlier cases, including 3 probable cases, who had died and not been buried safely.

The outbreak began in December 2013 when a small boy in a remote Guinean village, and three of his family members, died from a mysterious

▼ **Diagram showing the size of outbreaks of Ebola virus disease in West Africa between December 2013 and January 2014. The single case in Senegal and small outbreaks in Mali and Nigeria were directly imported from Guinea or Liberia, but that in the Democratic Republic of Congo was unrelated.**



Sources: WHO; UN; *The Economist*

*Includes cases in Italy, Spain, Britain and the United States. Excludes Congo

Image courtesy of Professor Lyn Gilbert

Professor Lyn Gilbert, Marie Bashir Institute for Emerging Infections and Biosecurity, University of Sydney.

◀ **Residents call attention to a man lying dead on a busy street in Monrovia, Liberia. who had died three days earlier. When no burial team came, people wearing rubber gloves dragged him into the street, stopping traffic and demanding he be taken away.**

Daniel Berehulak http://www.nytimes.com/slideshow/2015/04/20/blogs/20150420-lens-

disease. By the time the Guinean government notified WHO of an outbreak, in March 2014, it had spread to neighbouring towns and the Guinean capital, Conakry; it was identified as Ebola a week later. By then about 90 cases had been identified, two thirds of them fatal and the disease had spread to neighbouring Liberia and Sierra Leone. Already the extent of the outbreak was unprecedented: all 25 previous outbreaks, since 1976, when Ebola was first identified, had been in Central or East Africa and limited to single villages or small towns.

By June, Médicins sans Frontière (MSF) – one of few organisations working to contain it – described the West African outbreak as “out of control” but was accused of being alarmist, by the Guinean government and the World Health Organisation (WHO). WHO had initially sent a contingent of about 100 technical advisers to investigate, but had withdrawn them after being reassured that the outbreak in Guinea was under control.

It soon became clear that this was not the case, as more cases were reported in Liberia and Sierra Leone, including their capitals, Monrovia and Freetown, respectively. WHO remained indecisive and the rest of the world took little notice until early August, when two American aid workers with Ebola, were evacuated to the USA for treatment. On August 8th, WHO belatedly declared “a public health emergency of international concern” (PHIEC). Their only immediate action was to hastily convene an ethics committee to discuss the use of drugs with unproven efficacy and safety, after controversy had arisen when it was announced that the two Americans had been given the experimental drug, Z-Mapp. There was little other action on the ground and, in September, an increasingly frustrated MSF President, in an address to the United Nations (UN) General Assembly, criticised the “global coalition of inaction” and made an unprecedented plea for “massive deployment of military and civilian teams”… “to contain the biological disaster”.

Nearly three weeks later, the UN established the Mission for Ebola Emergency Response (UNMEER), with powers similar to that of a peace keeping mission and the first ever for a public health emergency. Over the next four months, international financial and human resources and government and NGO agencies were slowly mobilised and a relatively co-ordinated response established. But the disease continued to spread; by year’s end there had been around 20,000 cases and 8000 deaths, but the numbers, at last, began to fall, during 2015, as more treatment centres and laboratories were commissioned and contact tracing and safe burial teams deployed.

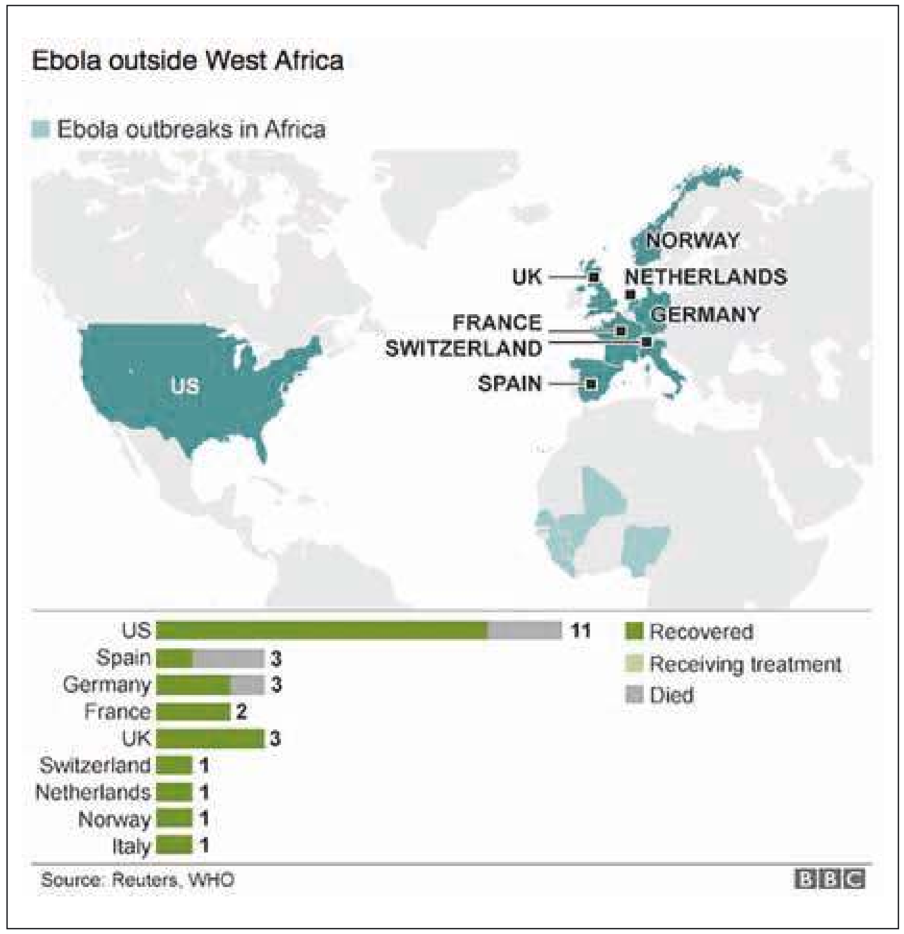
Meanwhile, the rest of the world began to fear for its own safety. In October 2015, a Liberian-American man was admitted to hospital in Dallas, Texas with Ebola, with a high fever and severe diarrhoea, a week after he had been first seen in the emergency department, with a vague flu-like illness, and sent home. He died a few days later, and then two nurses, who had cared for him, also developed Ebola. Although they recovered, this provoked acrimonious recriminations and over-reactions in the USA and elsewhere. Some countries banned – or threatened to ban – flights from West Africa, despite the likely serious adverse effects on control efforts; several US (and one Australian) states – inappropriately – mandated home quarantine of aid workers returning from Ebola-affected countries, despite warnings that it would jeopardise recruitment of volunteers. Australia temporarily blocked refugees from West Africa.

The Dallas incident also undermined reassurances from the Centers for Disease Control (CDC) that strictly applied “routine”

MADE IN THE USA
QUALITY KNOWS NO EQUAL
In 1987, Tempest became the first positive pressure ventilation fan used in firefighting. Today, we’re proud to say we’re still the most used and most trusted.
Tempest Technology Corp.
www.tempest.us.com

70 BAUER KOMPRESSOREN 1946 2016
BAUER COMPRESSORS
Quality. Our DNA
› Mini Verticus III Series
The most advanced compact unit system in Fire Stations and Vehicles. The system can deliever air up to 250l/min and can be upgraded to fully automatic with refrigeration dryer Air-Kool system, extrenal filling panel as well as stroage cylinders can be easily fitted.

› Containment Fill Statoins - Stationary & Mobile
BAUER offers only independently tested Containment Fill Stations which were found to protect from overpressure and fragmentation per NFPA 1901.
› BAUER Pure Air
As the market and technology leader in Breathing Air production, BAUER has instituted a Quality Seal as part of our worldwide campaign of information and quality certification in accordance with DIN EN 12021, which is in cooperation with TÜV.
BAUER PureAir - CERTIFICATE -
› BAUER COMPRESSORS ASIA PTE LTD
25 Pandan Crescent, #01-10 Tic Tech Center
Singapore 128477
Tel: +(65).6271.6271
Fax: +(65).6272.3345
Email: info@bauer-asia.com
www.bauergroup.com
TÜV SÜD



Source: Reuters, WHO

Image courtesy of Professor Lyn Gilbert

▲ **Map showing countries in Europe and North America to where patients with Ebola virus disease were treated. Most of whom were western healthcare or other aid workers, including three nurses (one in Spain, two in the USA) infected whilst caring for patients from West Africa. Five of these 26 people died; four had been airlifted to the West relatively late in the course of illness and the fifth was a Liberian man, who became ill shortly after returning to the USA, but in whom the diagnosis was only considered after he became gravely ill.**

infection control measures would prevent hospital transmission of Ebola. The CDC advice was not exactly wrong, but it failed to account for the fact that "routine" hospital infection control measures are often not properly applied, unless there is a strong suspicion of a very high-risk communicable disease.

Infections of nurses in USA and the terrible toll among healthcare workers in West Africa, focussed the attention of hospital administrators and frontline staff around he world. CDC modified their guidelines for the use of personal protective equipment (PPE) to emphasise the need for all skin, clothing and hair to be completely covered and that particular care be taken – with supervision – when removing potentially contaminated PPE. Alarming deficiencies of knowledge and standards of routine infection control practice were identified, reflecting the low priority often given to infection prevention and control. In Australia – and presumably in other countries – preparations to receive patients with Ebola were unco-ordinated and inconsistent between jurisdictions and hospitals. Fear that Ebolavirus had become more transmissible or virulent prompted suggestions for excessive precautions that were impractical, potentially dangerous and confusing. By the time nationally consistent Ebola prevention and control guidelines were published, the risk had almost passed. There were no Ebola cases in Australia and only a handful anywhere outside of Africa.

The latest WHO situation report (March 30th 2016) indicates a total of 28,646 reported confirmed, probable and suspected cases and 11,323 deaths associated with this outbreak (including 29 cases and 14 deaths in African countries, other than the three most affected, and seven cases reported in Europe and North America). Thankfully this was far fewer than the possible 500,000-1.4 million predicted in September 2014, but over 60 times more than any previous outbreak. The international ramifications have been immense.

WHO has been severely criticised for its delayed, ineffective response. But its ability to respond to infectious disease emergencies has always been limited, especially since a recent 50% budget cut. Local governments initially claimed that assistance was not needed and WHO was understandably cautious about declaring a PHEIC, after criticism that it over-reacted to the H1N1 influenza pandemic. Nevertheless, the WHO Director-General has acknowledged the shortcomings of its response and promised reforms to improve emergency response capacity, although clearly this will depend on funding from member states. There is a need to strengthen International Health Regulations, which require that member states acquire the capacity to identify and report infectious diseases of international concern and seek assistance to control them, if required. Considering their grossly inadequate healthcare and disease surveillance systems, Guinea, Liberia and Sierra Leone had neither the capacity nor, apparently, the will – at least initially – to comply.

The international community must also carry responsibility for a slow, initially inadequate, response. Many countries, including Australia, offered funds, but not the people who were desperately needed to build facilities and train local health workers. Many countries spent a fortune on their own hospital preparations, for what should be routine practice – effective infection prevention and control. We cannot predict when, or in what form, future infectious disease emergencies will occur, but that they will is inevitable. Next time we are unlikely to have the luxury of months of preparation time. If we are to avoid another devastating international or local epidemic comparable to the 2013-6 Ebola outbreak we must be better prepared and respond more quickly and effectively.

For more information, email lyn.gilbert@sydney.edu.au

GRADALL

HOW TO FURTHER IMPROVE
FIREFIGHTING
EFFICIENCY
AND SAFETY

TWO GRADALL FA MODELS NOW AVAILABLE

Gradall industries is introducing a second Fire Apparatus system, enabling firefighters to extend their reach even further to higher roofs or through walls and windows. FA Systems enable firefighters to drown dangerous fires with water or foam, all with remote controls that can reduce the chance for injury.

- **FA 70:** Reach over 20 meters, up to the roofs on six- or seven-story buildings.
- **FA 50:** Reach over 15 meters, attacking fires in buildings up to five stories in height.

Both Gradall FA models use a rugged telescoping, tilting boom and a stainless steel piercing head to smash through wood, masonry or concrete. Fires can be accessed in a fraction of the time required to use conventional methods.

GRADALL
FA
FIRE APPARATUS

SEE THE GRADALL FA IN ACTION ▶

WWW.GRADALLFA.COM

MTNORMAN@GRADALL.COM 001-1-330-339-2211

ALAMO GROUP

GRADALL INDUSTRIES, INC.
Where Ingenuity Works

KNOW YOUR INDUSTRY
BECOME AN
FPA AUSTRALIA
MEMBER TODAY!

Fire Protection Association Australia offers a flexible range of membership options to suit all stakeholders working in or associated with the fire protection industry in Australia.

Stay connected to your industry with the latest:
- News
- Events
- Technical information
- Resources

FPA AUSTRALIA

BECOME A MEMBER TODAY Call 1300 731 922
Email member@fpaa.com.au Visit www.fpaa.com.au

ELKHART BRASS
- Monitors
- Nozzles
- Valves

FRC
- Scene Lighting
- Governors
- Gauges

FOAMPRO
- Foam Proportioners
- Refill Systems
- Accessories

R·O·M CORPORATION
- Roll-up Doors
- Cargo Slides
- Compartment Lighting

EMERGENCIES DEMAND PERFORMANCE.

Safe Fleet Emergency & Industrial is the leading global provider of safety solutions for the fire industry. One company offers you the most extensive selection of products for the emergency market which includes our leading brands that have been battling fires for 125 years. Safe Fleet delivers experience and reliability when the situation demands performance.

SAFE FLEET
Emergency & Industrial

Thomas Fahrenbach
Sales Manager, Europe & Middle East
Phone: +49 6159 7174223
tfahrenbach@safefleet.net

Tim Schanno
Sales Manager, Asia & Pacific
Phone: +1.763.280.0895
tschanno@safefleet.net

Your Safety. Our Mission.

www.safefleet.net • 816.293.9040

Firefighting foam concentrates – the constant evolution: Part 1

In the last decade there have been many advances in foam for firefighting. Since 2001 the multinational 3M ceased to manufacture surfactants and fluorinated AFFF foams due to the ban on PFOS (perfluorooctyl sulfonates), a flurry of development has been carried out by manufacturers of fluorinated derivatives and foams.

Javier Castro

Javier Castro has been in the fire business from 2001. He has led all R&D activities on firefighting foam concentrates for Auxquimia, from AFFFs to Fluorine free over more than 15 years. Over this period of time he has developed some special products designed for very specific applications. He has been directly involved not only in product development, but very active on technical consultancy, always very close to end user´s needs. Mr. Castro holds a chemical Engineer Degree from Oviedo University and he has been deeply trained over his career on QHSE, Finance and Management amongst others.

The ban of PFOS required by an European and American Regulations, the decreasing of chains length (from 8 to 6 carbon atoms) in the fluorinated materials to reduce precursors of PFOA, the different proposals to limit the PFOA levels or even the regulation on the use of halogenated organic compounds in some countries have made the market of foams for firefighting very dynamic with changes on legislation, development of new products, etc. in the last decade. The fluorine-free foams (Fluorine Free, 3F, FFF) have become very important in recent times, in some cases even as substitutes for AFFF agents, being the subject matter of controversy and discussion in all international forums.

In addition to new formulations and types of foam, new testing standards have been developed and modified seeking test conditions as representative as possible of the real risks. Examples of this are the widely accepted protocol LASTFIRE tests as a requirement of foams in the petroleum industry or changes in the ICAO standard for airports. The European standard EN-1568, has been revised in 2008 and it has introduced new test fuels with respect to 2001 version; a new revision is on approval process and it will be published soon.

New fuels have gained importance in recent times, such as ethanol or gasoline with polar solvents as additives (e.g. the ethanol itself, MTBE, ETBE, etc.) which converts one specific type of hydrocarbon fuel in a complex mixture of hydrocarbons and polar solvents whose behaviour in contact with a foam solution has special features that should be taken into consideration.

The use of CAFS (Compressed Air Foam System) and the use of electronic foam proportioning systems have been

▼ Fire testing ground in Auxquimia´s facility, Spain.

© Image courtesy of AUXQUIMIA S.A.U.

Images courtesy of AUXQUIMIA S.A.U.

▲ **EN-1568-3:2008. Forceful application over heptane.**

a major technological breakthrough in the industry of fire fighting. These systems are more efficient and allow a precise control of dosage, even at very low proportions rates (0.1-1%).

Throughout this article we will briefly review the changes in the foam sector to fight fires in the last decade, especially in the following fields:

1. Testing Standards
2. Environmental regulations
3. Fuels
4. Foam Concentrate
5. Fire-fighting Systems

1. Testing Standards

Until 2001, when the European Standard EN-1568 unified the criteria for approving and evaluating the foam concentrates, each country used its own standards, what made very difficult to compare the quality of foam concentrates manufactured in different countries.

Since 2001, the reference standard in Europe for testing and qualification of foam is the standard EN-1568, which consists of four parts:

- EN-1568-1: Fire extinguishing media. Foam concentrates. Specification for medium expansion foam concentrates for surface application to water-non miscible liquids.
- EN-1568-2: Fire extinguishing media. Foam concentrates. Specification for high expansion foam concentrates for surface application to water-non miscible liquids.
- EN-1568-3: Fire extinguishing media. Foam concentrates. Specification for low expansion foam concentrates for surface application to water-no miscible liquids.
- EN-1568-4: Fire extinguishing media. Foam concentrates. Specification for low expansion foam concentrates for surface application to water-miscible liquids.

In 2008, a new version replaced the original edition from 2001. The most significant changes between the two versions are:

- Definition of the material for the testing pans (Stainless Steel).
- Clarification of the requirements for a product to be classified as IA according to EN-1568-3, especially in the French version of the standard.
- Introduction of a new fuel on the fire tests of Part 4 (Isopropyl Alcohol).

The standards EN-1568-1: 2008 and EN-1568-2: 2008 do not establish classifications for products, only the fulfilment or not of the standards themselves. However parts 3 and 4 (EN 1568-3: 2008 and EN 1568-4: 2008) establish a classification of products according to their performance on the fire, both in extinguishment and in re ignition. For this reason, it is not enough to establish as requirement the compliance with these standards, but it should be indicated the minimum classification required for each individual part of the standard applicable (3-4).

Below we make a summary of the possible classifications for foams according to these standards:

EN 1568-3: 2008

- I: Extinction capacity by forceful application to hydrocarbons.
- II: Extinction capacity by forceful application to hydrocarbons when the application of the foam is interrupted (slow extinction).
- III: Extinction capacity with hydrocarbons by gentle application.

◀ **EN-1568-3:2008. Gentle application over heptane.**

Once the extinction test has been carried out, it is performed a burn back test to measure the level of protection that the foam is able to provide after extinguishment. There are four classifications (A, B, C and D); A indicates the highest level of resistance and D the lowest.

A product that meets the standard EN-1568-3 can be classified between class IA (maximum) and class IIID (minimum), it can be also classified in the intermediate range of classes between class IA and class IIID.

EN 1568-4: 2008

On polar solvents, tests are performed only with gentle application and the classifications are as follows:

- I: if extinction time is below 3 minutes.
- II: if extinction time is longer than 3 minutes.

In this case, it is also carried out a burn back test to determine the resistance of the foam, being the class A for those foams with longer burn back times and the class D for the shortest.

The new version of 2008, in addition to the acetone test, has incorporated a test with isopropyl alcohol (IPA). Some foams with good behaviour on acetone are very poor in other polar solvents such as IPA. For this reason it was decided to keep both fuels in the standard in order to have a more realistic range of behaviours of the foam. It must be pointed out that the rankings may be different for both fuels, e.g. the same foam can be rated as IA with acetone and IIB with IPA.

****Those users who want to have premium quality products, which are capable of dealing with any hazard of liquid fires with guarantees, should demand products rated IA or IB according to EN-1568-3 / 4:2008.

Along 2016 is expected to be published a third version of EN-1568, which will include new classifications, reference to Fluorine Free Foams and some ecotoxicological data.

Until the appearance of standard EN 13565-2 (“Fixed firefighting systems. Foam systems, design, construction and maintenance”) in May 2009, the different classifications according to the test standard EN-1568 had no impact in the design of firefighting systems. EN 13565-2, depending on the classification of the foam according to the standard EN-1568 i.e. depending on the quality of the foam, settles the application rates to be used, “rewarding” those products with a higher performance at lower application rates. It also takes into account what type of system to use (foam cameras, monitors, spears manuals, etc.) in the design of operating conditions.

Image courtesy of AUXQUIMIA S.A.U.

▲ **EN-1568-4:2008. Acetone test.**

UL-162

UL listing based on the standard UL-162 (Foam Equipment and Liquid Concentrates) is a worldwide recognized standard for testing firefighting foam concentrates. The laboratory which manages this certification, follow-ups, etc. is Underwriter Laboratories Inc. (UL).

The main difference with other standard for foams is that UL-162 not only describe a fire testing method for foam concentrate but also a “compatibility” confirmation between all the components that are present in the “chain” from the manufacturing process to the final use of the product; compatibility with drums, proportioning tests, foam quality tests, marking, etc. are subjected to the standard. Additionally, a follow up is required in a quarterly base; samples of concentrates and containers are taken and sent to UL laboratories for verification.

The listing or certification process for UL-162 is more complex than for other standards as EN-1568, ICAO, LASTFIRE, etc. with which only physic-chemical properties and fire tests are analyzed in fixed conditions. UL-162 requires to conduct foam quality tests with commercial equipment (UL listed) in order to verify foam quality previously to fire testing.

For the above, the customers who require UL listed concentrates are not only demanding a fire performance (which is covered by other standards) but also for a product with a performance of the foam when it is used with a specific type of equipment and which is subjected to periodically controls by an external body, assuring homogeneity along the time with not formulation or packing changes out of control.

According to UL-162 there are 3 different applications that a foam concentrate can be listed with:

- Sprinklers and Spray Nozzle (point 9)
- Topside Discharge Devices (point 10)
- Subsurface Injection (point 11)

Each type of application has a different testing method.

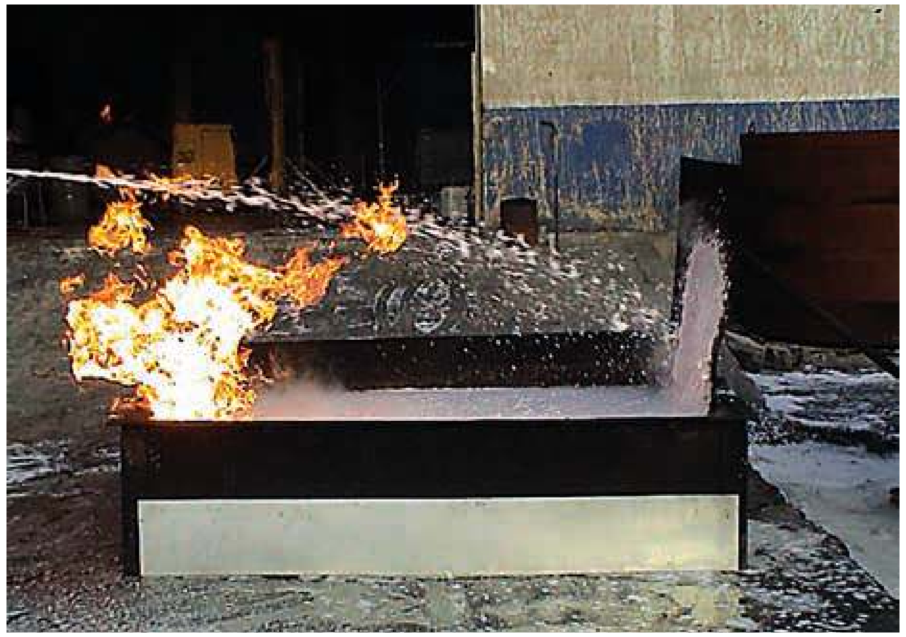
The most common and the normal requirement is the Topside Discharge defined as “A method of foam discharge wherein the foam is applied onto the top of burning fuel surface”. This type of discharge includes monitors, hand nozzles, foam chambers, etc.

Full-scale equipment (“field installed components, such as proportioners and foam makers that are intended to extinguish fires”) should be selected for the listing process with the concentrate. Both proportioner and foam maker should be UL listed for the operation conditions that will be used in the tests.

Images courtesy of AUXQUIMIA S.A.U.

▲ Type III foam discharge.

The fire tests have to be conducted with a nozzle which gives approximate same expansion and 25% drainage time of the full-scale equipment (tolerances are detailed in the standard). Depending on the equipment selected, the foam quality generated will have different properties so fire performance can be also difference; non-aspirating monitors, which have an excellent reach, produce pourer foam quality than aspirating hand nozzles; with non-aspirating devices the foam concentrate quality should be high quality to pass the UL-162 tests.



◀ Type II foam discharge.

Fire Tests Topside discharge

The UL-162 establishes two different topside application discharge outlets:

- Type III: For portable or fixed devices that delivers foam directly onto the fuel surface causing general agitation (monitor, hose stream nozzles, etc.).
- Type II: Fixed devices that deliver foam in a "gentle" manner (foam chambers, foam makers, etc…)

The hydrocarbons fire tests are conducted using heptane. The discharge type and application rate depends on the type of product (Proteinic, Fluoroproteinic, Synthetic, AFFF, FFFP) according to table 3.

In case of polar solvents, there is a reference fuel for each type of chemical structure (see table 4). Only Type II application can be listed for polar solvents and the application is selected by the manufacturer and should be indicated in the listing certificate. Note that MTBE requires a specific tests to be considered listed with this fuel.

Each foam concentrate only can be delivered with the container which is listed with. It is not allowed to mark with UL logo packing not approved or those that not meets UL-162 requirement for example totes or IBC.

LASTFIRE

For the oil industry, the greater risk of fire comes from the large hydrocarbon storage tanks, where are stored large tonnages of liquid fuel products. The LASTFIRE test protocol simulates the difficult conditions that occur during a fire in a storage tank, such as the longer time of pre-combustion, metal sheets with great thickness at high temperature, etc. as well as various types of foam application that can be used to extinguish the fire, from the use of aspirated or non-aspirated monitors to the fixed systems. The protocol sets three types of tests:

- Semi-aspirated: Simulates foam application with non-aspirated monitors.
- Aspirated: Simulates foam application with aspirated monitors.
- System: Simulates foam application with foam chambers.

According to this protocol and for each test, the foams obtain different scores depending on fire control time, extinguishing time, vapour suppression and burn back resistance. Then as a result of the obtained score, the products are classified as "Good", "Acceptable", "Reduced" and "Poor" Fire Performance. The compliance for the petrochemical industry to LASTFIRE protocol should be acceptable or good rating in all three types of application.

Airports, through the International Civil Aviation Organization (ICAO), has also been active in updating their testing procedures; These changes have been approved in 2013. So far, two levels of foam quality were established: Level A and Level B. Every airport, according to its category and its firefighting equipment must use foam of one of those two levels. Since every time planes seem to get bigger, therefore the risk is also increasing, a new level in the certification for foams has been created, level C, which makes possible to extinguish fires with larger surfaces using the same equipment.

Apart from the introduction of the new level C, the protocol has changed slightly and will not allow the movement of the nozzle throughout the test, which makes extinction more difficult. By contrast, the standard will allow longer time for extinguishment (From 1min to 2 min.)

TABLE 3 – FOAM APPLICATION AND BURNBACK IGNITION

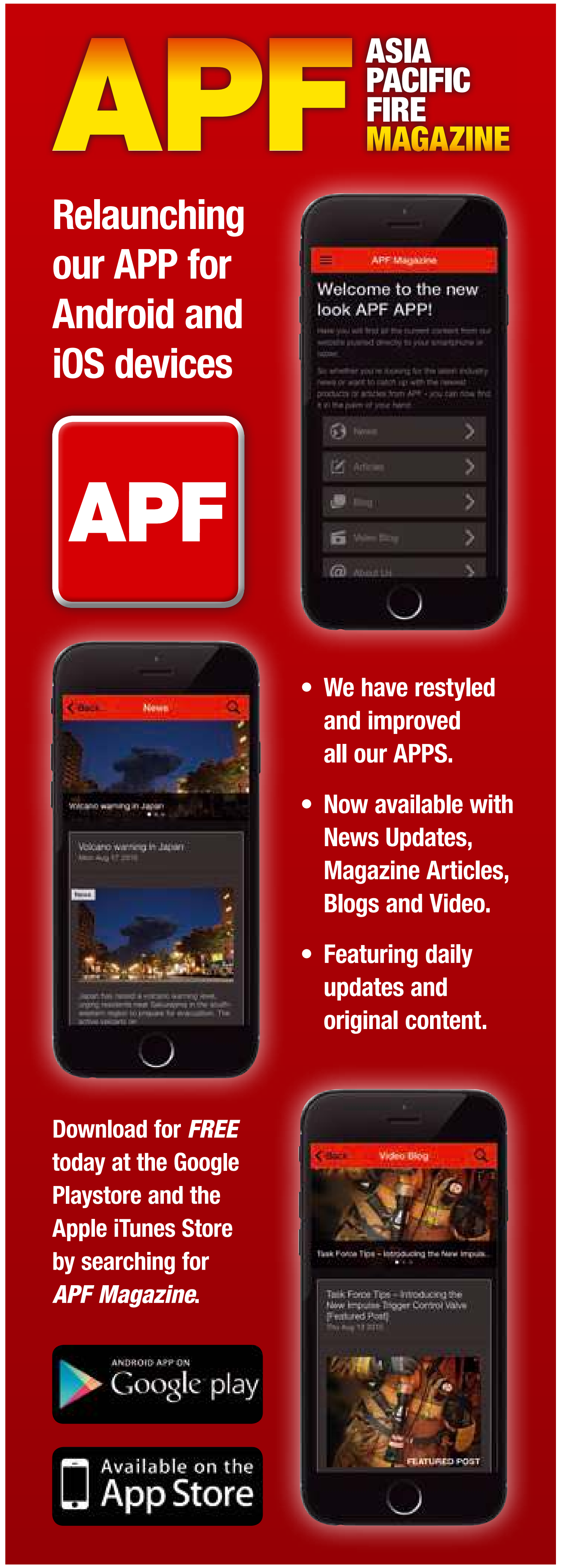
Application	Foam Concentrate	Fuel Group	Test application density, gpm/ft2	Time of foam application, minutes	Duration until burnback ignition, minutes	Minimum Design application density, gpm/ft2
1, Type III Discharge Outlets	P, FP, S, FFFP, AFFF, FFFP	Hydrocarbon Hydrocarbon	0.06 0.04	5 3	15 9	0.16 0.10
2. Type II Discharge Outlets	P, FP, S, FFFP, AFFF, FFFP, All	Hydrocarbon Hydrocarbon Polar	0.06 0.04 b	5 3 5	15 9 15	0.10 0.10 c

TABLE 4 – FUELS FOR POLAR SOLVENT TEST

Polar Solvent Group	Standard Test Fuel
Alcohol	Isopropyl Alcohol
Ketones	Dimethyl Ketone
Esters	N-Butyl acetate
Carboxylic Acids	Glacial Acetic Acid
Amines	Ethylene Diamine
Aldehydes	Propyonaldehyde
Ethers, except Diethyl and Methyl Tertiary Butyl Ether	Isopropyl Ether
Impurities for any polar test fuel is not to exceed 1.0 percent	

For more information, go to www.auxquimia.com

WHEN THE SITUATION GETS ROUGH,
MAKING BUBBLES IS NOT ENOUGH...
TRUST THE BEST,
LET US BE YOUR FOAM SOLUTION
AUXQUIMIA
Fire fighting products
THE FOAM SOLUTION
ICL Performance Products
Where needs take us
T (+34) 985 242 945 / 6 I 24H EMERGENCY (+44) 01202864796 I auxquimia@icl-group.com I www.auxquimia.com


APF Magazine
Welcome to the new look APF APP!
News
Articles
Blog
Video Blog
About Us
Back
Volcano warning in Japan
Video Blog
Task Force Tips – Introducing the New Impulse Trigger Control Valve (Featured Post)
FEATURED POST

APF ASIA PACIFIC FIRE MAGAZINE

Relaunching our APP for Android and iOS devices

APF

- We have restyled and improved all our APPS.
- Now available with News Updates, Magazine Articles, Blogs and Video.
- Featuring daily updates and original content.

Download for *FREE* today at the Google Playstore and the Apple iTunes Store by searching for *APF Magazine*.

ANDROID APP ON Google play

Available on the App Store

ADVERTISERS' INDEX

Advanced Electronics	2
AFAC 2016 Powered by Deutsche Messe	69
Akron Brass Company	67
Auxquimia Fire Fighting Products	111
Bauer Compressors Asia Pte. Ltd.	103
Bristol Uniforms Ltd.	61
Bronto Skylift Aust./NZ	63
Bruck Textiles	63
Bullard Asia Pacific	73
Coltraco Ultrasonics	4
Coltri Asia Pacific Co. Ltd.	45
Cutters Edge	42
Dafo Fomtec	36
DQE, Inc.	79
Dr. Sthamer Hamburg	41
Dynax Corporation	39
Esri	31
Exova Warringtonfire Aus Pty Ltd.	12
FFE	89
Fire & Disaster Asia 2016 Singapore	15
Fire Protection Association Australia	106
Firetrace International	93
Gradall SERV	105
Groves Incorporated	23
Haagen Fire Training Products	45
Hainsworth Technology	61
Hatz Diesel	67
HD Fire Protect Pvt Ltd.	69
Holmatro Rescue Equipment	IBC
Janus Fire Systems	88
Kidde AirSense	6
LHD Group Hong Kong Ltd.	56-57
PAB Akrapovic	9
PAC Fire Australia	59
Pacific Helmets (NZ) Ltd.	76
Performance Advantage Company	100
Safe Fleet	106
Safety Components Inc.	19
Saphire Complete Training Concepts	79
Security Essen 2016	21
Super Vacuum Manufacturing Co., Inc.	11
Task Force Tips, Inc.	IFC/01
Teikoku I-Sen Co.	25
Tempest Technology Corporation	102
Texas A & M Emergency Services Training Institute	35
The S.E.A. Group	53
The Solberg Company	51
TLX Technologies	13
Tyco Fire Protection Products	OBC
Waterax	17
Yone Corporation	97
Ziamatic Corporation	35
Ziegler	85

Come and see us at

AFAC16

30 Aug – 1 Sep 2016 • Brisbane, Australia

FIRE & DISASTER ASIA 2016 SINGAPORE

28-30 September 2016 • Singapore

www.mdmpublishing.com

New: Greenline EVO

Up to 33% faster while delivering the same performance: Holmatro introduces the next evolution in battery-operated rescue tools. Cutters, spreaders, combi tools and rams enabling you to do the same job in less time. Because in rescue every second counts!

You can count on us, for life

holmatro.com/en/greenlineEVO

Holmatro Rescue World

holmatro
mastering **power**

A CENTURY OF LEADERSHIP

A FUTURE OF INNOVATION

www.ansul.com

ASIA PACIFIC SALES OFFICES

Singapore · Beijing · Guangzhou · Shanghai · Wuhan · Busan · Seoul · Taipei · Hong Kong
Jakarta · Bangalore · Mumbai · New Delhi · Brisbane · Melbourne · Perth · Sydney · Christchurch

DISTRIBUTION
Everywhere

CONTACT US AT info.apac@tycofp.com

APF

ASIA PACIFIC FIRE MAGAZINE

REPORTING TO THE ASIA PACIFIC FIRE PROTECTION AND FIRE SERVICE INDUSTRY

www.apfmag.com
Issue 59 • October 2016

FM APPROVED

NFPA #1964
Compliant

Fixed Station and Portable Monitors • Master Stream Nozzles • Self Educting Foam Nozzles • LDH Hardware, Manifolds, Intake and Discharge Valves • Hazardous Location Monitors

Industrial Fire

Nozzles • Valves, Wyes and Tees • Foam Equipment and CAFS Nozzles • Bumper Mount Monitors • Tools and Accessories

Wildland Fire

Intake Valves • Jumbo Wyes, Siamese and Gated Manifolds • Hydrant Assist Valves • Gated Wyes and Water Thiefs • Suction Hose and Strainers

Water Supply

Fixed, Selectable and Automatic • Standard, Low and Dual Pressure • Smooth Bores and Ball Valves • Pressure Gauges and Flow Indicators • Specialty Nozzles & Accessories

Handheld Nozzles

Fixed and Remote Control Monitors and Nozzles • Intake Valves, Adapters, Elbows and Fittings • Monitor Manifolds • Tools and Accessories

Fire Apparatus Equipment

Foam Nozzles and Attachments • Eductors • Self-Educting Nozzles • Foam Injection and Application Systems

Foam Equipment

TFT®
TASK FORCE TIPS®
FIRE FIGHTING EQUIPMENT

G-Force™

MADE IN USA

3701 INNOVATION WAY
VALPARAISO, IN U.S.A.

+1.219.548.4000

www.tft.com • www.newforce.tft.com

by: TASK FORCE TIPS

TECHNOLOGY IS SECURITY.

With the Z-Class we supply extremely high performance for airport fire fighting and rescue vehicles. A modular concept enables the configuration of 4 x 4 to 8 x 8-vehicles. The vehicle size, the quantities of extinguishing agents, as well as special superstructures and components of the Z-Class fully meet the manifold tactical mission requirements. Especially with the High Reach Extendable Turret Z-Attack ZIEGLER offers a maximum of technology.

www.ziegler.de

Ziegler

APF
ASIA PACIFIC FIRE MAGAZINE
REPORTING TO THE ASIA PACIFIC FIRE PROTECTION AND FIRE SERVICE INDUSTRY
www.apfmag.com
Issue 59 • October 2016

OCTOBER 2016 • ISSUE 59

Cover image: Dual pressure automatic nozzles, such as the *MidForce* nozzle shown here, provide maximum stream reach and penetration in high pressure mode, and maximum flow when the low pressure mode is selected. Image courtesy of S. Haase.

Publishers
Mark Seton
mark.seton@mdmpublishing.com
David Staddon
dave.staddon@mdmpublishing.com

Editor
Neil Bibby **ASFM, FAICD, MIFireE**
neil.bibby@mdmpublishing.com

Contributing Editors
Rhonda Abotomey, Martin Boyle, Penny Burns, Javier Castro, Chris Chiesa, Ed Comeau, Robert Fawcett, David J. Ganz, Jeff Kepert, Thomas Loridan, Torbjorn Lundmark, Michelle Murphy, Steve O'Malley, Gary Parkinson, Ange Pestell, Peter Ryan, Brett Shields, Brett Staines, Deb Symons, Melanie Taylor, William Thurston, Kevin Tory, Bronwyn Walker, Joel Ward, Duncan J. White.

Design Manager
Richard Parsons
richard.parsons@mdmpublishing.com

Web and IT Manager
Neil Spinney
neil.spinney@mdmpublishing.com

International Sales
Mark Seton
mark.seton@mdmpublishing.com

Mark Bathard
mark.bathard@mdmpublishing.com

Dave Staddon
dave.staddon@mdmpublishing.com

APF is published quarterly by:
MDM Publishing Ltd
The Abbey Manor Business Centre,
The Abbey, Preston Road,
Yeovil, Somerset, BA20 2EN, UK.
Tel: +44 (0) 1935 426 428
Fax: +44 (0) 1935 426 926
Website: www.mdmpublishing.com

MDM Publishing Ltd (Australia)
23 Richardson Street, Lane Cove,
NSW 2066, Australia.
Tel: +61 (0) 418 358 465

©All rights reserved

ISSN – 1476-1386

DISCLAIMER: The views and opinions expressed in ASIA PACIFIC FIRE are not necessarily those of MDM Publishing Ltd. The magazine and publishers are in no way responsible or legally liable for any errors or anomalies made within the editorial by our authors. All articles are protected by copyright and written permission must be sought from the publishers for reprinting or any form of duplication of any of the magazines content. Any queries should be addressed in writing to the publishers.

Reprints of articles are available on request.
Prices on application to the Publishers.

Designed, Edited and Printed in the UK.

***FREE* Subscription**
To subscribe to APF Magazine and for unlimited access to our digital resources, please register at www.apfmag.com

PROUD TO BE A MEMBER OF
CFPA-Asia

Contents

OCTOBER 2016

REGULARS

5 Editors Comment
7 Industry Comment
8 News and Profiles

FEATURES

24 Emergency response in Antarctica
31 Firefighting foam concentrates – the constant evolution: Part 2
36 Improving survival for 'out of hospital' cardiac arrest
41 Gaseous fire suppression systems – understanding safety measures
48 Women and Firefighting Australasia 2016: Right place. Right time
55 Protective clothing and equipment for Fire Fighters
59 A hands on approach
64 Firefighting and breathing protection then and now
68 The convergence of video and fire safety
72 The wisdom of a crowd: warnings of the future
76 20 Years of innovation at the Pacific Disaster Center
81 Conventional vs addressable fire alarm systems
84 Integrated fire management and community based fire management
88 The effects of turbulent plume dynamics on long-range spotting
93 The preparedness and evacuation behaviour of Australian pet owners
99 A heatwave classification for heat related fatality risk
102 PTG and PTS – reflecting on the trauma response of growth amongst the decline

facebook LinkedIn twitter Google+

The Standard in Fire Systems

Axis EN
for the EN54 world

Axis AX
for the UL 864 world

Wherever ease-of-use, performance, and reliability are important, you'll find an Advanced intelligent fire system.

Our Axis systems include advances in synchronized audio, false alarm management and touchscreen graphics.

Advanced
The Standard in Fire Systems

Dubai Office
Dubai Airport Free Zone, Building W3,
Office 211, Dubai UAE
Tel: +971 4 299 0908
Fax: +971 4 299 0554

Email: sales@advancedco.com

UK and EMEAA HQ
Moorland Way, Cramlington,
Northumberland, NE23 1WE UK
Tel: +44 (0)1670 707 111
Fax: +44 (0)1670 707 222

Web: www.advancedco.com

Advanced

Has diversity failed? We need to try harder!

'Doing the same thing over and over again and expecting a different result' is a definition of insanity.

Neil Bibby
AFSM, FAICD, MIFireE
Editor

In 1990 I was given the task to break the male domination of the fire service I belonged to at the time. Like all Australian Fire Services, there were no female firefighters in the organization when I started. If I had been asked, back them, 'what would the fire service look like in 2016?' I would have predicted 30% to 40% female and a good representation of other ethnic groups in the service. I was wrong and failed. As a male 25 years ago I/we didn't know what we didn't know about the issues relating to diversity, we even had all male committees trying to figure out how to recruit females.

Over the past 25 years we have had reports, research, seminars, conferences and committees looking at increased diversity in our fire services and we are still not getting traction. Let's look at the facts in the Asia Pacific region, although the figures vary depending on the source, these figures are close enough to make the point. Percentage of female Fire fighters: – Australia 3.3%, New Zealand 2.8%, Hong Kong 2.5%, Singapore 14%, Malaysia 4% and the Pacific Islands 0.5%. It is not much better outside of our region, USA 3.3%, UK 3.1% and Germany 1.5%. The total number of females in the service today is not good by any standard, However, the number is more of an embarrassment when you look at the proportion of females in leadership positions. A recent Department of Environment, Land, Water and Planning report (Victoria, Australia) showed that in a department with 26% female firefighters (one of the exceptions when it comes to female numbers) of the 37 specialist and command positions males dominated all but eight positions and of those eight positions none where a command situation.

So we are not looking good, I have been to three conferences so far this year where diversity was high on the program agenda and we appear to be doing the same old thing. What did Einstein define as insanity? 'doing the same thing over and over again and expecting a different result' Have we been doing this for 25 years?

Although I didn't do too well in my early years at this, I hope I have learned some useful lessons. Let me offer some ideas:

1. Listen to the females, blokes, you have not walked in their shoes therefore you have no idea.
2. Make the workplace friendly to a diverse workforce, both on the station and the fire ground. We have the technology now to make it easier and work smarter instead of just brute force. Nursing has done this very well as a profession.
3. Change behaviour, a recent report showed the 88% of female fire fighters had suffered harassment (physical and sexual) This is where male and female champions need to speak up, support and fight back. Public executions may be a little too far, but these morons need to be held to account. Management support is essential.
4. All research into bringing minority groups (of course women are not a minority group) into the main stream shows a need to have a critical mass to succeed. Maybe affirmative acting is the way to overcome 25 years of failure, whatever action is taken we need to get that critical mass.

Then there are point 5, 6, 7, … .. .. and more, that are the new initiatives that people have been reticent to try because they are too far from the norm, give them a go, you cannot do worse than the last 25 years. We must get to the point that in 25 years from now we look back and say we have succeeded.

So if you have ideas put them out there for management to take up or just do it locally. Although I have concentrated on females in the fire service, full diversity is the aim, so our emergency services have a workforce that represent the community they protect.

> **Make the workplace friendly to a diverse workforce, both on the station and the fire ground. We have the technology now to make it easier and work smarter instead of just brute force. Nursing has done this very well as a profession.**

COLTRACO
Ultrasonics | since 1987

PORTASTEELE™
CALCULATOR

convert the liquid level
into the mass/weight of suppressant agent

ideal tool for fire servicing
for CO2, FM-200R & Novec™ 1230
for fixed fire suppression systems

use Portasteele™ Calculator with:

PORTALEVEL™ MAX

Handheld ultrasonic liquid level
indicator leading technology
ABS & RINA Approved
Flagship model
UL Listed

NFPA Code
Compliant
2001 & 12A

UL LISTED

Quote #APF-16 for info

Call +44 207 629 8475 or Email sales@coltraco.co.uk

www.coltraco.com

Building an industry to be proud of

Whether it's through our training and accreditation programs, recognising excellence, contribution and commitment at our Gala Awards, or our ongoing advocacy for improved regulation, codes and standards, Fire Protection Association Australia is committed to building a better industry.

Scott Williams
CEO – FPA Australia

It's a commitment we back up with action and investment every day and with the continued support of our members and the wider industry, we are measurably raising the bar.

In recent years much has been made about a lack of professionalism in the fire protection industry. As many fire protection work activities are unlicensed, at least in Australia, negative perceptions have (justifiably) emerged about cowboy operators working with little accountability.

As an Association, we have always taken these concerns seriously but over the past five years we've translated this concern into strong action, investing heavily into initiatives to improve the professionalism of our industry and its standing with the community.

Three strong examples of this action are our accreditation programs, our upcoming Gala Awards event and our ongoing advocacy work. In 2012, after years of clamor from both industry and regulators for national accreditation/ licensing of the full range of fire protection activities, we launched our Fire Protection Accreditation Scheme (FPAS), starting with the inspect and test areas of work.

Moving our industry to embrace professional accreditation was no easy task. However today many thousands of individuals are accredited by FPA Australia or on the journey to accreditation, supported by hundreds of industry-leading businesses, ranging from small operations to the largest companies in the industry.

Accreditation via FPAS guarantees minimum levels of training and competency of individuals as well as ensuring that important safeguards are adhered to at the business level, such as holding the appropriate insurances.

We have recently launched the Design and Certify accreditation categories, while also expanding our existing bushfire accreditation scheme (BPAD) into new states including Western Australia. And we're just getting started. In 2016-17 the Association is ramping up our accreditation development to ensure that all work activities in the industry will soon be covered by an accreditation category.

In addition to accrediting professionals, we want to celebrate them too. That's why in 2016 we're holding our inaugural Fire Protection Industry Awards Gala event in Sydney on the 3rd of November. The event introduces four new awards to our existing accolades: Young Achiever, Barry Lee Technical Excellence award and the prestigious Fire Protection Company of The Year Award (in two size categories).

By showcasing the best our industry has to offer, we are redoubling our commitment to professionalism and providing strong benchmarks for all industry stakeholders to aspire to.

Building these awards as a respected platform for celebrating excellence will be an ongoing process but we know they are a necessary and fun way to highlight the pinnacle of Australian fire protection.

Finally, with so many other activities it would be easy to take our eyes of one of our core mandates: tirelessly advocating for regulatory change to benefit our industry and safeguard the community from the dangers of fire.

For years we have led the charge for a nationally harmonised approach to fire protection inspection and testing and this has now been achieved with all states and territories accepting AS 1851-2012 as a best practice method of recording and reporting maintenance activities.

Additionally, we have gained representation on the Australian Building Codes Board's Building Codes Committee, appeared before several Senate inquiries and spent thousands of hours meeting with regulators at all levels and in all jurisdictions, all with a laser-like focus on one simple goal: best practice fire protection outcomes.

We're not just talking about making the fire protection industry better; we're doing it every day. Our members and our industry partners make this work possible and we thank you for your ongoing support and commitment.

Together we're shaping a professional industry we can all be proud of.

For more information, go to www.fpaa.com.au

Accreditation via FPAS guarantees minimum levels of training and competency of individuals as well as ensuring that important safeguards are adhered to at the business level, such as holding the appropriate insurances.

Global ARFF vehicle from Fraser Fire and Rescue

Fraser Fire and Rescue in New Zealand are the leading manufacturer and exporter of fire-engines, equipment and components in the Southern Hemisphere. The Wellington based company manufacture a diverse range of fire and rescue vehicles plus associated components using the latest three-dimensional virtual design tools to ensure their customers receive a complete concept-to-completion service. Given their unrivalled customer satisfaction the Fraser brand has rapidly gained global recognition in this highly competitive market!

Fraser Fire and Rescue have recently fulfilled the delivery of this eye-catching commercial based aviation, rescue and fire-fighting vehicle to the Cook Islands Airport Authority. This prototype 6x6 ARFF vehicle which is now operational with the Rarotonga International Airport Rescue Fire Service on the largest of the islands is the first fire engine completed by the company following a recently signed collaboration between the United Kingdoms market leading co-polymer vehicle body manufacturer Strongs Plastic Products; and Fraser Fire and Rescue.

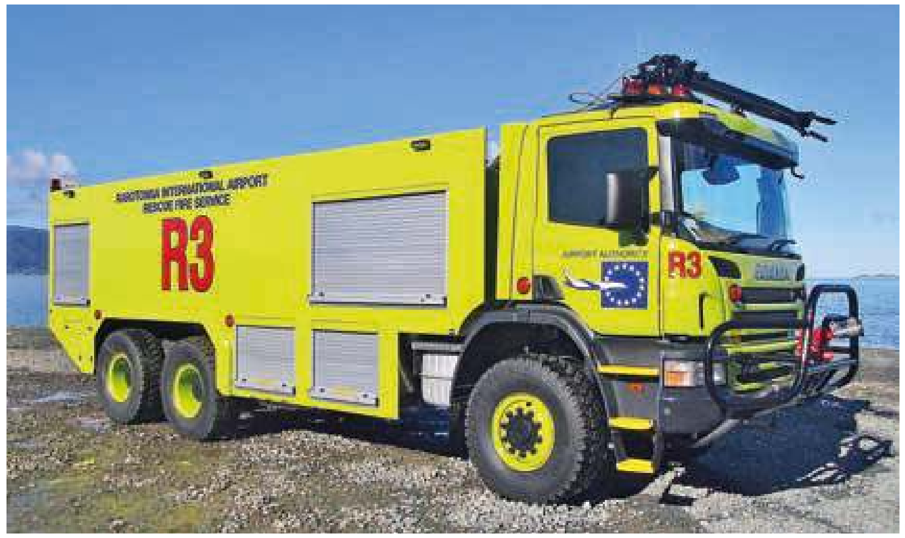


Image courtesy of Gary Parkinson

This striking fire-engine makes use of a robust special build Scania P460HHZ 6x6 chassis incorporating a 460 hp Euro 5 diesel engine, Allison 12 speed automated manual transmission and ABS braking; plus a Scania "day-cab" accommodating the driver and one crew.

The tender features a tailor made one piece high density plastic body manufactured by Strongs Plastic Products incorporating 7 spacious lockers enclosed by roller shutter doors, rear top-deck access and integrated tanks holding 9,400 litres of water and 1,200 litres of foam plus a fixed 250 kg DCP system courtesy of Perren Engineering Limited.

The tender was specified with a Darley PSP 1500 pump delivering 5,678 lpm @ 10 bar, an ACL foam proportioning system, 1 x 60 metre Fraser hose-reel, an under body fire protection system plus a remote Akron Trident roof mounted monitor delivering 7,600lpm and a remote 500lpm Akron Fire Fox bumper mounted turret.

This airport crash tender was manufactured to the customer's specific requirements, meets all current ICAO and NFPA standards.

For more information, go to www.fraser.org.nz

Zico debuts adjustable chainsaw mount

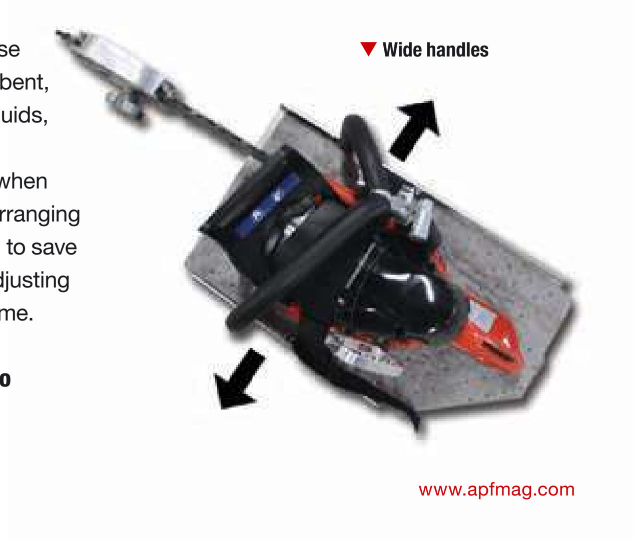
Zico has done it again, debuting the next evolution in chainsaw mounting, the QUIC-MOUNT Adjustable Chainsaw Mount, Model QM-ACSM-1.

The Adjustable Chainsaw Mount accommodates virtually any gas-powered saw, including circular, giving you a custom fit without the custom cost. Simply slide the base tray in for thinner saws or pull it out for wider ones – it's as simple as that.

Made with heavy-duty aluminum, the wide nylon strap is easy to release with or without gloves. An absorbent, replaceable pad collects loose fluids, keeping compartments clean.

Model QM-ACSM-1 is great when mounting a new saw or just re-arranging your current lineup, allowing you to save money over time by simply re-adjusting instead of buying all new each time.

For more information, go to www.ziamatic.com



Airport's hangar protected by FFE

To protect workers during aircraft spray-painting, Cambridge International Airport have installed nine Talentum flame detectors and one Fireray beam detector from FFE.

"Because of the explosive nature of the paint used in the hangar, explosion-proof flame detectors were necessary," commented Brian Myall, Fire Safety Officer for Marshall Aerospace and Defence Group, the company which manages the airport. "Our chosen installer specified Talentum UV/IR2 flame detectors and we are very impressed by their performance and reliability so far."

In addition to the hazardous area of the hangar, a Fireray 5000 beam smoke detector is installed at ceiling level for general smoke detection.

Flame detectors are ideally suited to this type of installation as they detect almost all types of flickering flames. This is especially important in this application, where flames can originate from the paint and many other sources, including plastics, composites and even metals. By utilising infra-red (IR) sensing, they can also identify flames through dust, steam or smoke and are immune to the effects of wind or draughts.

The Talentum UV/IR2 also gives the highest immunity to false flame sources, with internal self-test sources that check the detector's operation when remotely instructed. The maximum ambient temperature is normally 55°C or 85°C for the higher temperature specification detectors.

For general smoke detection in large indoor spaces with high ceilings, like aircraft hangars, conventional point smoke detectors are not suitable as they can only be used at heights of up to 10.5 metres. Beam smoke detectors on the other hand can be used up to 40 metres. Wall-mounted, they transmit a beam of invisible infrared light across the building space to be protected and a receiver detects and measures the light and can recognise smoke interference anywhere along the beam path.

All types of aircraft, both civilian and military are painted at the site, which is capable of accommodating planes as large as a Boeing 747. The FFE units were installed by EFire of Norfolk.

Commenting on the installation, FFE's Managing Director Mark Osborne said, "This is yet another example of the wide range of applications where our products can be used. We are delighted to have been selected to protect Cambridge International Airport in this way."

For more information, go to www.ffeuk.com

fireray®
The world's most trusted beam

Protect the lens of your Fireray beam smoke detector from condensation

The Fireray heater is designed to be used in environmental conditions where condensation affects the operation of optical beam smoke detectors.

- Significantly reduces the likelihood of condensation
- Maintains the detector lens at a higher temperature than the surrounding air
- Stops false alarms

ffe
T +44 (0) 1462 444 740
E sales@ffeuk.com
W www.ffeuk.com

Hainsworth appoints new consultant for Australian fire market

Leading protective textile manufacturer A.W.Hainsworth & Sons Ltd is pleased to introduce consultant Keith Ward who has joined the team to represent Hainsworth Technology in the Australian and New Zealand fire market.

Keith has many years' experience working in the fire market and, until recently, was the owner and Managing Director of PAC Fire, a nationwide distributor of fire-fighting equipment.

Australia and New Zealand are important markets for Hainsworth Technology and Keith will play a vital role in promoting Hainsworth Technology's range of technical protective fabrics to both garment manufacturers and the fire-fighters themselves.

TITAN, a Hainsworth Technology, has already being chosen by the fire fighters of New South Wales as well the Capital Territories and many Industrial fire brigades. TITAN is Hainsworth Technology's intelligent flame retardant outer shell system, which provides thermal protection with its unique and innovative design.

Hainsworth's popular ECO-DRY fabrics have recently being trailed by several wildland fire fighting brigades across Australia and are having proven results in providing the best comfort, durability and performance of any fabric in the market. ECO-DRY Technology presents a range of solutions, both outer shell and linings, incorporating the benefits of wool, to offer the wearer optimum protection and the best levels of comfort, especially in bush fire conditions.

Keith will support fire fighters in Australia and New Zealand and continue to promote Hainsworth's three core values Design that Saves, Protection that Shows and Quality that Lasts, he said "I believe Hainsworth ECO-DRY and TITAN cloths are world leading technology and I am excited about increasing the Australian and NZ fire markets awareness of the Hainsworth range".

For more information, go to www.protectsyou.co.uk

ESKA gets hands on in Australia

After many years of supplying it's high end gloves through out the world and into Australia World leading glove manufacturer ESKA is proud to announce the opening of ESKA Australia. In a bid to offer further support to it's growing band of customers ESKA has appointed Joel and Mégan Ward as it's representatives for Australia/NZ. Joel has a wealth of experience in the fire industry previously being the General Manager of Pac Fire Australia and is the driving force behind the development of the ESKA glove range sold in Australia.

ESKA Structural Fire Fighting Gloves such as the Supermars Plus are already a very popular glove with the Australian Fire Fighters however we have not stopped there with ESKA Australia releasing two new styles. The Warrior was developed for those customers who still wanted a quality product but had a budget in mind. ESKA Australia has also released the ARES which we believe is a world first being a non leather glove certified to AS2161.6:2014.

All of the structural fire fighting gloves that ESKA offer's into Australia are all fully certified to AS2161.6:2014 with no exceptions as at ESKA we do not cut corners and offer only the best protection for our customers.

"With such a complex and important job our Emergency Services personal conduct we felt it imperative that we set up ESKA Australia to support them and allow greater access and customer service to our range of gloves " Joel Ward sales manager ESKA Australia.

The protection of people´s hands is a tradition that goes back over 100 years in the family business, ESKA. The company is enjoying its fourth generation now. The Austrians sensitively combine state-of-the-art with tradition and train, as before, glove makers of the old school. "We leave nothing to chance and trust the creativity of our employees. With our own in-house glove making department and sewing workshop we are particularly flexible, and our short decision paths enable us to respond quickly to the requirements of the global market", confirms ESKA Managing Director, Paul Loos.

The ESKA product ranges:

- **PROFESSIONAL: Protection and comfort under extreme conditions** Fire brigade, occupational safety, police, authority and military gloves for any job.
- **LUXURY: Like a second skin** High-quality leather gloves in sophisticated or also exciting designs.
- **SPORTS: Protection and heat firmly in grasp** Skiing and motorcycle gloves with highly functional materials and a fresh look.

Joel will be working in Australia and New Zealand to assist ESKA customers.

For more information, go to www.eskaaus.com.au

Safety Components leads the way, introducing Glide Ice™ Thermal Liners

"I'm feeling hotter in my turnout gear" is a common phrase stated by firefighters year after year. This epidemic is largely attributed to fires burning hotter with ambient air temperatures also continuing to rise. Safety Components, the global leader in firefighting fabric technology has listened and answered the call by developing a game-changing solution – Glide Ice thermal liners engineered with DuPont™ Nomex® filament.

Glide, consistently worn by more US metro cities than any other thermal liner and the world's leading high performance thermal liner for firefighters since 1997, just got better. Glide Ice will build on the "slicker, softer and more comfortable" pedigree found in all Glide thermal liner options produced by Safety Components over the past two decades. Glide Ice feels cool with its ice blue design woven in Safety Components patented weave that combines 60% DuPont™ Nomex® filament yarns with 40% DuPont™ Nomex®/Lenzing® FR spun yarns.

Utilizing DuPont™ Nomex® filament, Glide Ice features superior performance in breathability, freedom of movement, comfort, heat blocking capability, moisture management and fast dry times. Our patented high lubricity weave is lighter and slicker than competitive liner systems. Glide Ice, with DuPont™ Nomex® filament, guarantees better freedom of movement and longer lasting freedom of movement than any thermal liner in the world today.

Guy Lucas, Director of Marketing, SCI, commented, "At Safety Components, we always do what is best and what is right for first responders. Our continued commitment to the development of FR fabric solutions with enhanced safety, innovative design and life-improving technologies is unwavering." Mr. Lucas went on to say, "We are truly excited to bring Glide Ice to dedicated firefighters around the globe."

Glide Ice thermal liners ensure you stay cooler, drier and more comfortable in the hottest situations. Glide Ice, the coolest way to fight fire.

Glide Ice is fully UL approved and certified for a seamless transition from Glide Gold with DuPont™ Kevlar® filament to Glide Ice with DuPont™ Nomex® filament. With the full support of Safety Components and DuPont™, fire departments will start receiving Glide Ice in Q4 of 2016.

DuPont™, Nomex® and Kevlar® are registered trademarks or trademarks of E. I. DuPont de Nemours and Company or its affiliates.

For more information, go to www.glideice.com

The next evolution in battery-operated rescue tools – the Greenline EVO range

Holmatro introduces a new generation of battery-operated rescue tools which are faster than ever, without concessions on performance. The range is named Greenline EVO and consists of three cutters, three spreaders, four combi tools and two rams. All Greenline EVO tools offer up to 33% more speed, delivering the same performance in less time.

Greenline features and benefits maintained

Next to a higher tool speed the new EVO range still offers all benefits of our existing Greenline concept:

Self-contained

- For optimal freedom of movement
- Rapid deployment: simply press the start button and start working

Latest lithium-ion battery technology

- Long battery life combined with high capacity for maximum operational use
- Low self-discharge rate
- Suitable for use at high altitudes
- LED indicator to check battery capacity left

Battery on top of the tools

- Quick and easy to change, even in narrow spaces

Emission-free

- No fumes: healthier for rescuers
- Ideal for use in confined spaces
- Environmentally friendly

All weather proof

- Suitable for use at below zero temperatures, down to -20°C / -4°F

Control handle centrally positioned on the back of the tools

- Always within reach
- Tool can rotate freely while your hand stays in the same position

Fraser Fire and Rescue Ltd

Demountable fire platform development

Working in collaboration with the New Zealand Defence Force, Fraser Fire and Rescue Ltd has just commenced production of a fleet of Demountable Fire Platforms (DFP's) (also known as 'PODS') following the successful field trials of a Prototype within the New Zealand Army's rugged Waiouru training camp.

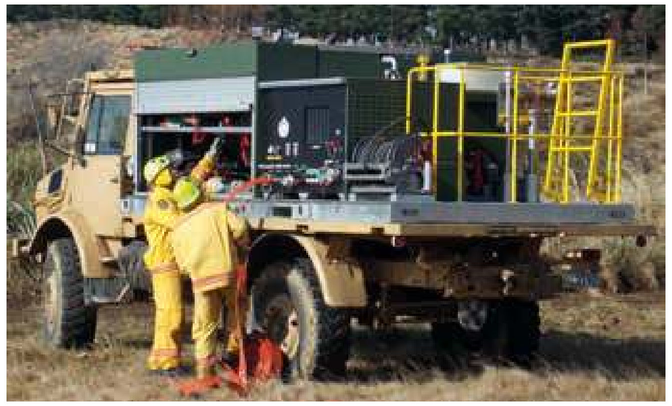
The Prototype Demountable Fire Platform was developed to provide the New Zealand Defence Force with a modern fire-fighting capability whilst utilising the robust 1980's era Mercedes-Benz MOG cab-chassis which are well aligned to the tough off-road conditions within which they will typically operate. The MOG/DFP 'match-up' will typically be used to respond to live-firing exercises within New Zealand Army and New Zealand Airforce operating environments – additionally they will be deployed to assist the New Zealand Fire Service as and where required.

Using a modular design philosophy, we applied a number of their known design and manufacturing techniques to arrive at the finished appliance. With a fabricated light but robust steel sub-frame, supporting a 2000L HDPE roto-molded water-tank and two generously sized lockers, the DFP is a highly versatile piece of fire-fighting equipment which is light in weight enabling more equipment to be carried. Encompassing a Darley Ultra High Pressure (UHP)/High Volume diesel driven pump set, the DFP also provides 60 litres of Class A foam to support a variety of fire-fighting scenarios. The DFP is easily able to be removed by forklift, front end loader or overhead crane in order that it can be switched to a different host vehicle or set on the ground for independent operation. During fielding testing the Firefighters involved in the various exercises were impressed with the level of foam performance from both the pump-set and the high pressure nozzle (which provides for both straight and fog streams), the Darley pump-set's ability to seamlessly change between water/foam usage, the large throw range (extinguishing from a safe distance of greater than ten metres) and the unit's capability at hot spot destruction.

The whole philosophy behind the New Zealand Defence Forces' thinking on this project is that the DFP unit can be easily transferrable between vehicles so that in the event of vehicle failure it can be swapped over and mounted onto any twist lock container truck deck or even off loaded onto the ground to be operated in areas where there is a static operational need (such as temporary fuel dumps). Although primarily designed to fit onto the MOG, the DFP has been trialled on the New Zealand Defence Force new M.A.N MHOV replacement vehicles on which it maybe used on overseas deployment or indeed on any other flat-bed truck with container fixings.

During field trials, the MOG/DFP combination proved extremely versatile on the most rugged off-road terrain and the UHP pump gave excellent fire cover using a minimal amount of water which is a necessity when dealing with remote situations where water resources are scarce.

Fraser Fire and Rescue Ltd is particularly excited about the potential usage of the DFP given its ability to provide flexibility with the choice of cab-chassis and the low water requirement of the pump-set.



◀ The DFP Prototype during field trials at Waiouru Military Camp.

▼ The foam nozzle in use during field trials.

📷 Image courtesy of WATERAX

For more information, go to www.fraser.org.nz

New!

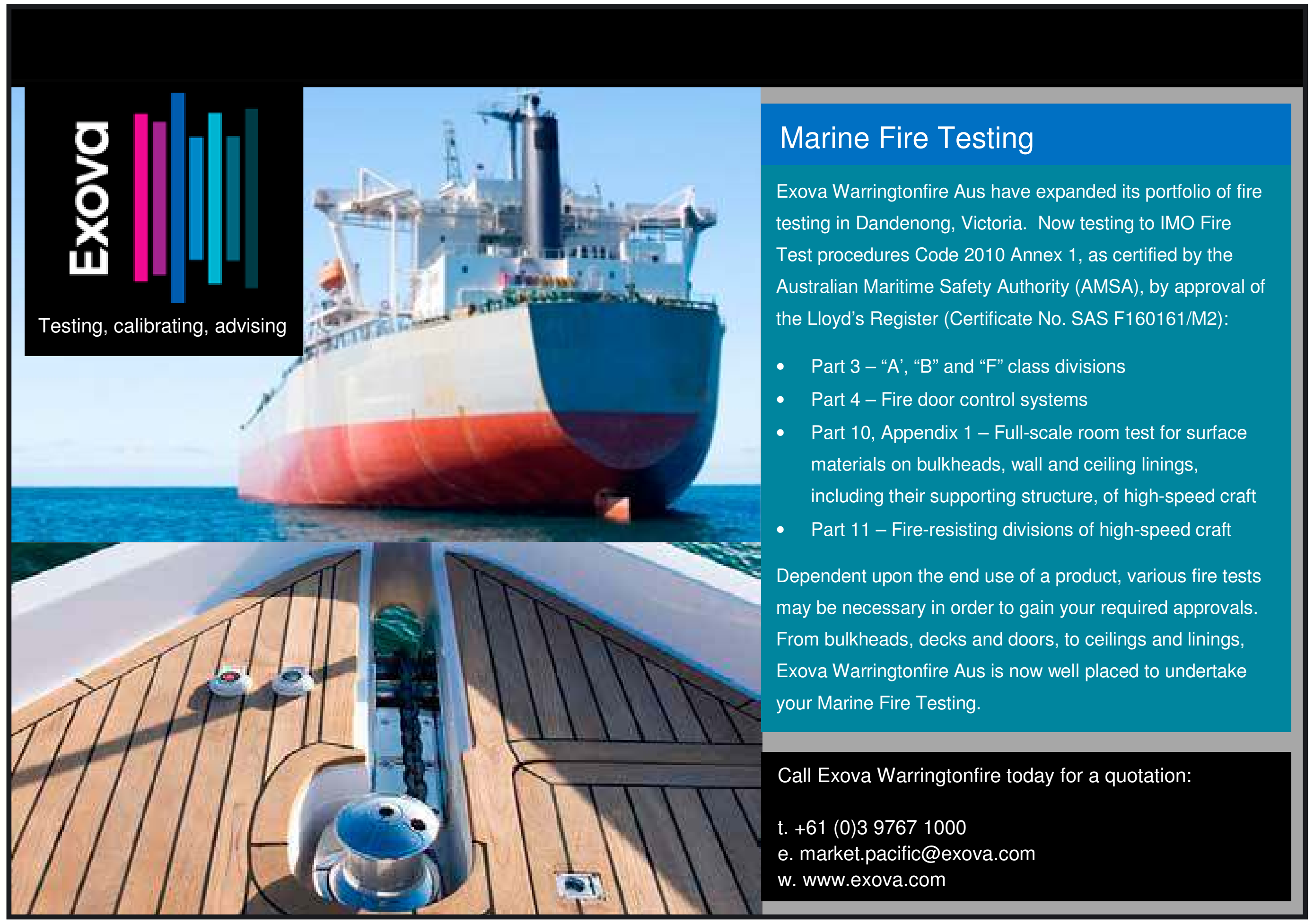
DUAL AIR CYLINDER BRACKET

Models DCAB-5 & DCAB-6

- Accommodates dual cylinder SCBA & SCUBA with or without a harness
- Thermoplastic, non-mar, high-cycle clips can be adjusted along heavy-duty aluminum extrusions to secure a wide range of cylinder sizes
- Easily mounted to virtually any flat surface

Zico
ZIAMATIC CORP

1-800-711-FIRE | ziamatic.com



Exova
Testing, calibrating, advising

Marine Fire Testing

Exova Warringtonfire Aus have expanded its portfolio of fire testing in Dandenong, Victoria. Now testing to IMO Fire Test procedures Code 2010 Annex 1, as certified by the Australian Maritime Safety Authority (AMSA), by approval of the Lloyd's Register (Certificate No. SAS F160161/M2):

- Part 3 – "A", "B" and "F" class divisions
- Part 4 – Fire door control systems
- Part 10, Appendix 1 – Full-scale room test for surface materials on bulkheads, wall and ceiling linings, including their supporting structure, of high-speed craft
- Part 11 – Fire-resisting divisions of high-speed craft

Dependent upon the end use of a product, various fire tests may be necessary in order to gain your required approvals. From bulkheads, decks and doors, to ceilings and linings, Exova Warringtonfire Aus is now well placed to undertake your Marine Fire Testing.

Call Exova Warringtonfire today for a quotation:

t. +61 (0)3 9767 1000
e. market.pacific@exova.com
w. www.exova.com

What can you put on your truck for $99.00 that promotes on the job safety and prevents heat injuries?

HeatSeeker Technology & Design provides you a low cost, immediate option on scene, utilizing minimal water and cool an area up to 30 degrees.

HEATSEEKER
TECHNOLOGY & DESIGN, LLC
855-474-3473 • firegroundrehab.com
Built by firefighters for firefighters

HeatSeeker Technology & Design

Making a commitment to save the lives of firefighters'

HeatSeeker Technology & Design, LLC, based in Knoxville, TN, has made a commitment to save the lives of firefighters around the globe by producing products that assist in rehabilitation on emergency scenes. There have been multiple studies conducted that evaluated the causes of injuries and deaths of firefighters as well as the amount of money spent on treatment and replacement due to lost time. HeatSeeker Technology & Design, LLC is making rehab a tactical consideration.

More firefighters die in the line of duty from heart attacks than from any other cause. The second leading cause is slips, trips and falls. While the two may seem unrelated, previous research suggests that heat stress may be a common causal factor in both, heart attacks in overweight firefighters with high blood pressure and slips, trips and falls. While departments worldwide have policies and procedures in place for rehabbing line firefighters, there are still an unacceptable number of fatalities and injuries every year due to these factors.

▲ Rural Metro firefighter's Derrick Kaucher and Lt. Eric Knoefel cooling at a working structure fire in Knoxville, TN.

▼ Rural Metro firefighters taking a break from ECL class.

Images courtesy of HeatSeeker Technology & Design, LLC

In 2010, there were 71,875 line of duty injuries and 72 line of duty deaths in the United States. 49% of the deaths were due to sudden cardiac death. While being able to withstand the elevated heart rates through aerobic exercise and fitness training, the stress cannot be eliminated. The increased body temperatures have several impacts on the bodies of firefighters.

These injuries and fatalities not only have an impact on the fire protection community but on the communities that they protect as well. Another impact that must be considered is the monetary impact that it has on the economy. According to the National Institute of Standards and Technology (NIST), the total economic burden to the nation for addressing and preventing firefighter injuries is $2.7 billion to $7.8 billion annually.

Image courtesy of HeatSeeker Technology & Design, LLC

▲ **Some of the first test days using a basic garden hose in the back yard!**

Personal Protective Equipment (PPE) worn by firefighters contributes to an increase in core body temperatures of working firefighters. While this equipment is intended to protect the body from the dangers of the environments that firefighters encounter, it also retains the heat that is built up inside. Natural methods of cooling the body include sweating for evaporative cooling, and increasing heart and respiratory rates to assist in disseminating heat from the body. During fire ground activities, disseminating heat is at best difficult and often times near impossible. Elevated body temperatures increases the clotting factors of blood which may play a role in sudden cardiac death. Dehydration greater than 2% of the body weight of an individual will adversely affect mental function of simple tests. This can lead to poor decision making and in turn increase the chances of taking unnecessary risks.

Many of these issues can now be addressed with the addition of a new technology developed by HeatSeeker Technology & Design, LLC which is based in Knoxville, TN. HeatSeeker Technology & Design, LLC saw a need for making firefighter cooling and rehabilitation a tactical consideration and developed a tool to assist in this effort. The innovative Six Shooter, as well as other products available from the company, is able to lower air temperature as much as 30°F to assist in cooling firefighters and lowering their core temperatures to help in preventing cardiac insult and other injuries.

These products can be attached and left on discharges on any fire apparatus and utilized with little to no set up. They utilize the water from the booster tank on any pumping apparatus or municipal water system and uses less than 3gallons of water per hour. They are adaptable to any hose or appliance that is carried on most any apparatus for more applications as well. The cooling provided by these tools can have a major impact on lowering both injuries and sudden cardiac deaths suffered by firefighters globally when used in conjunction with fitness activities and medical screenings as outlined in NFPA guides 1582 and 1583.

HeatSeeker Technology & Design, LLC is currently testing other products to be available soon that are geared toward the same campaign against firefighter and sport's related injuries and fatalities around the globe. A full line of the products offered by HeatSeeker Technology & Design, LLC is available at www.firegroundrehab.com. We are now starting a second campaign and will be out soon. www.HeatSeekerArmy.com. The battle has begun to reduce LODDs!! The products offered are created by firefighters for firefighters in the USA.

For more information, go to www.firegroundrehab.com

▼ **Rural Metro Explorers cooling at the training center!**

ONE PLATFORM FOR MULTIPLE OPERATIONS

Esri® ArcGIS® software provides a framework to integrate all types of data, sensors, and activities in real time to understand and share actionable information to make your community safe.

Learn more at esri.com/Safe-APFM

esri®

Copyright © 2016 Esri. All rights reserved.

TENMAT Ventilated Fire Barriers

Preventing fire spread in external cavities

Fires in external cavities of clad buildings are a major issue which appear with ever increasing frequency in the news headlines across the globe. Ventilated cladding systems are an extremely effective method of protecting a structure from the elements and Architects embrace these systems due to the wide range of colours and finishes and the ease of installation. As good as these systems are, they can create a serious fire protection threat to structures and people if not adequately protected. The cavity acts like an open chimney and allows the fire to spread quickly both vertically and horizontally around the building. The fire is often hidden behind the façade and can be extremely difficult to deal with for the Fire Services.

TENMAT manufacture a range of innovative Ventilated Fire Barriers that are designed to maintain the ventilated cavity in normal conditions but will rapidly expand to seal off the cavity in the event of a fire and ensure that the fire is contained.

The range consists of Ventilated Fire Barriers to suit small cavities, such as 10mm render cavities right up to 500mm cavities that can be found in some rainscreen cladding systems. The product range is backed up with extensive third party test evidence to prove that the products are tested in the applications in which they will be installed. The test evidence covers a wide range of constructions, insulation types and cavity sizes.

Tenmat is a leading manufacturer of advanced composite engineering materials, which includes the range of passive fire protection solutions. The company's headquarters is situated in Trafford Park, Manchester, UK where the first composite engineering components were created at the turn of the twentieth century. The Tenmat group is a multinational corporation with presence in the United States of America, Canada, France, Sweden, Germany and Italy as well as a global network of vendors and distributors.

Tenmat are active members in the fire, timber and offsite industries and are constantly developing new solutions for the industry. Tenmat invests heavily in R&D and prides itself on innovation. This resulted in Tenmat winning The Queen's Award for Innovation which was then followed by The Queens Award for International Trade.

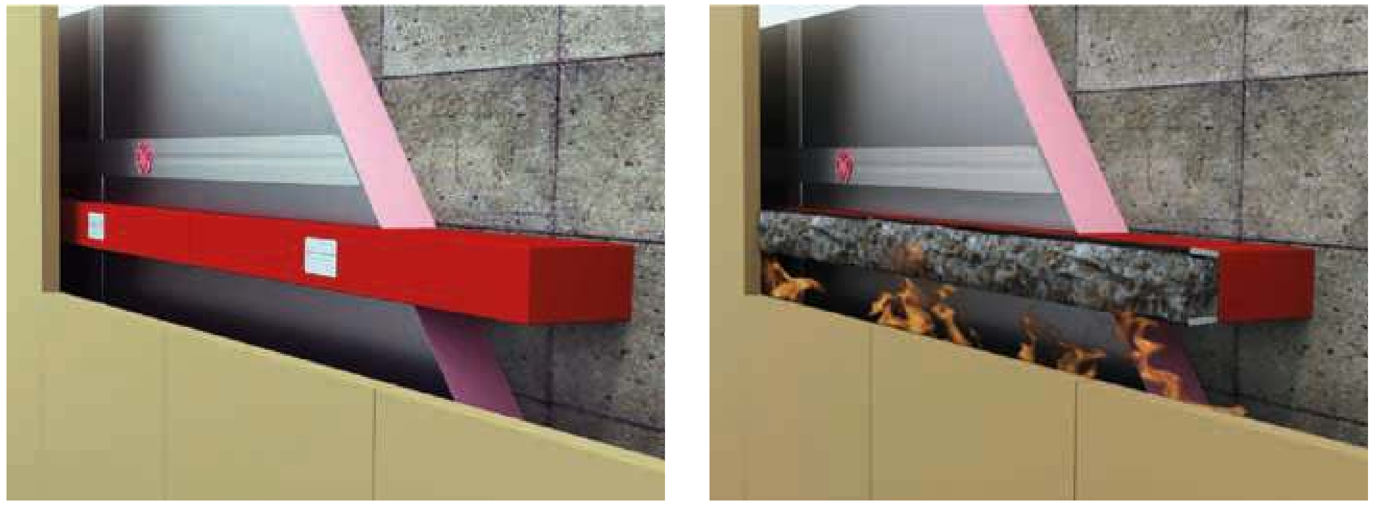
The Tenmat Ventilated Fire Barriers are regarded as the market leading product of this type and bodies such as NHBC (National House Building Council) have utilised them in independent studies, such as the NF51 which looked at the performance of cavity barriers in external walls with combustible materials.

The Tenmat Ventilated Fire Barriers are typically installed at floor level and are suitable for any type of project where the aim is to compartmentalise the external cavity to prevent the spread of fire. The types of projects where these products are utilised include; Hotels, Student Accommodation, Hospitals, Care Homes, Residential and Commercial projects. The Tenmat Ventilated Fire Barriers have been installed on projects throughout the world over the last decade, including Europe, Australia and New Zealand. Some examples of prestigious projects include; Glasgow Commonwealth Games, One Tower Bridge London, Hotel Football Old Trafford, Palermo Hospital Italy and BBC Media City.

The Tenmat Ventilated Fire Barriers are available through a worldwide distribution network, including in Australia and New Zealand. For more information on your nearest distributor or for more information in the product range please contact Tenmat.

For more information, go to www.tenmat.com

▼ The pictures below show the VFB in normal conditions and then in a fire situation.



Images courtesy of TENMAT

My name is Magnus.
I am working with product development at Fomtec.
This picture is from a fire test in Sweden. Follow us if you want to find out more about me, the Fomtec way and all our products.

Follow us
Twitter @ fomtec
Facebook Dafo Fomtec AB
Webpage www.fomtec.com

fomtec
Fire Fighting Foams & Equipment

China (Kunming) Southeast Asia and South Asia Fire Safety and Emergency Rescue Technology Expo

To make Yunnan a pivot of China's fire information opening-up to South and Southeast Asia has become a major strategic task of the new era. With execution of the Communist of China(CPC) policies,China (Kunming) Southeast Asia & South Asia Fire Safety and Emergency Rescue Technology Expo , which is organized by Yunnan Fire Protection Association, China Council for the Promotion of International Trade Yunnan Sub-Council, will be held on November 9-11, 2016.

Themed at "Innovation, Cooperation, Exchange, Harmony", we take the great opportunity of prevailing economy in South Asia & Southeast Asia to build a extraordinary platform for fire industry between China and other countries, striving to showcase the hi-tech fire equipment and support for expanding business as well as promoting brands. To take good advantage of Yunnan Province is planned for strategic tasks such as "One Belt One Road", "the Bangladesh-China-India-Myanmar Economic Corridor" and so forth.

The Expo will be estimated over 30,000 m2 , 500 exhibitors and 50 000 visitors from more than 20 countries and areas. We will accelerate our efforts to build Yunnan into the transaction center of fire equipment and technology in South Asia and Southeast Asia, enhancing fire industry of Yunnan to a new level.

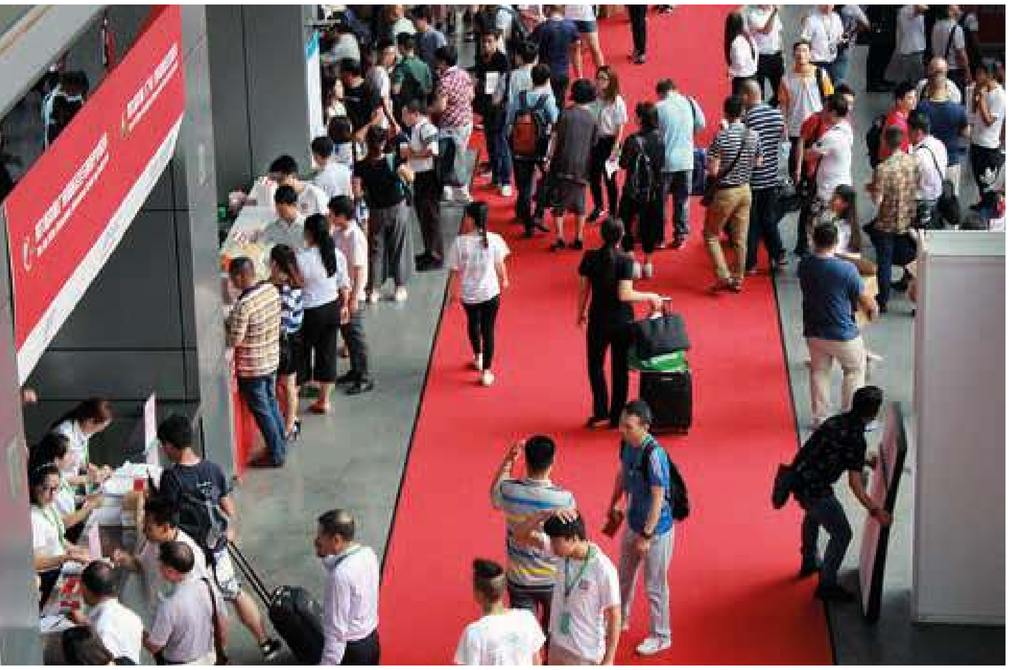
In the meantime, there will be The 2nd International Safety Forum which includes Main Forum,

International Safety Forum
全球智慧安全
升展览服务有限公司
思惠安全科技有限公

▲ The Opening Ceremony of the International Safety Forum.

Images courtesy of Yunnan Fire Protection Association

▼ The Entrance to the Fire Exhibition Venue.



For more information, go to www.cfe.cn.com

Date:	**Nov 9-11, 2016**
Venue:	**China·Kunming Dianchi International Convention& Exhibition Center**
Advisor:	**Yunnan Provincial Fire Brigade Department of Commerce of Yunnan Province**
Organizer:	**Yunnan Fire Protection Association China Council for the Promotion of International Trade Yunnan Sub-Council**
Operator:	**Guangzhou Lisheng Exhibition Co., Ltd**

中国（昆明）东南亚·南亚
消防安全暨应急救援技术展览会
China (Kunming) Southeast Asia & South Asia Fire Safety and Emergency Rescue Technology Expo

时间：2016年11月9-11日
地点：昆明滇池国际会展中心

Nov.9-11, 2016
Venue: China Kunming Dianchi International Convention & Exhibition Center

指导单位
云南省公安消防总队、云南省商务厅

主办单位：
云南省消防协会、云南省贸促会

协办单位：
国际应急管理学会
香港安全协会
中国安全产业协会
中国阻燃学会
广东省应急产业学会
海南省消防协会
黑龙江省消防协会
云南省劳动保护科学技术学会
云南省校园安全协会

承办单位：
广州立升展览服务有限公司

Advisor:
Yunnan Provincial Fire Brigade
Department of Commerce of Yunnan Province

Organizer:
Yunnan Fire Protection Association
China Council for the Promotion of International Trade Yunnan Sub-Council

Co-organizer:
The International Emergency Management Society
Hong Kong Security Association
China Safety Industry Association
China Flame Retardant Society（CFRS）
Guangdong Industry Association of Emergency Management
Hainan Province Fire Protection Association
Yunnan Municipal Society of Labour Protection

Operator:
Guangzhou Lisheng Exhibition Co., Ltd.

承办单位：广州立升展览服务有限公司
地址：广州市番禺区亚运大道潮田工业区华姿产业园A栋2楼

邮编：511440
电话：+86 20 85641278
传真：+86 20 3646 4649
官网：www.cfe.cn.com

AFAC 2016

Brisbane hosts record breaking fire & emergency management conference

More than 2300 emergency management personnel and volunteers, researchers and fire industry professionals gathered in Brisbane at the end of August to hear the latest research findings, explore new approaches to disaster management and learn about new life-saving technologies.

AFAC16 powered by INTERSCHUTZ, was the largest emergency management conference and exhibition in Australasia, held from 30 August to 1 September at the Brisbane Convention and Exhibition Centre

A new partnership between the AFAC and Deutsche Messe Australia, organisers of the internationally renowned INTERSCHUTZ exhibition held in Germany every five years, contributed to a successful AFAC16 powered by INTERSCHUTZ conference and exhibition.

The display included 160 exhibitors from over 14 countries demonstrating an extensive range of equipment and services to the emergency management professionals and first responders.

Sponsors included Fujitsu, Pheonix G2, Capita, Adashi, Isuzu Trucks, GAAM Emergency Products, Hino, DigitalGlobe, Esri Australia, Motorola Solutions and Tait Communications.

Highlights of the exhibition included a live demonstration area that featured The Australasian Road Rescue Organisation (ARRO) who demonstrated severe road crash rescue simulations. Also demonstrated was a virtual fire training system using smoke and special screens by BullEx & HAAGEN, and a fire retardant solution that drops solar panels voltage to zero, removing the risk of explosion, by PV Stop. Smokeshield also demonstrated a fire training simulation. SASGAR Fire and Rescue also displayed the Rosenbauer L20-FA Combined Aerial Pumping Appliance.

A nearby expo stage featured practical sessions across a broad range of topics including technologies and innovation advancements through to human factors.

Stuart Ellis AM, CEO, AFAC observed that the conference played an integral role in the continued development of the emergency management sector across Australasia.

▼ 160 exhibitors from 14 countries showed how innovative the industry is.

Image courtesy of AFAC

▶ This year practical demonstrations allowed delegates to see products in action.

"AFAC16 provided attendees a valuable opportunity to share knowledge and information, learn from one another and get to know each other. Over three days there were more than 100 engaging presentations and countless insightful and inspiring discussions.

"The successful partnership between AFAC and Deutsche Messe Australia has resulted in the largest trade exhibition in the history of the AFAC conference. AFAC16 has seen record delegate numbers walk through the doors to hear about the latest in research, technology and equipment in the emergency management sector," said Mr Ellis.

Such was the success of this year's exhibition, that 65 percent of exhibition space was pre-booked onsite for AFAC17, which will be held from 4 – 7 September 2017 at the new International Convention Centre Sydney (ICC Sydney).

Highlight speakers included Rhoda Mae Kerr, Chief of the Austin Fire Department (USA) who presented on the importance of diversity, inclusion and leading by example. Mark Crosweller, Director-General of Emergency Management Australia outlined how the sector needs to transform to align with the changing rules of disasters and Katarina Carroll, Commissioner at Queensland Fire and Emergency Services explored the challenges, complexities and opportunities of leadership within the emergency sector.

Katarina Carroll, Commissioner, Queensland Fire and Emergency Services was proud to host the event in Brisbane, applauding the underlying theme of Mitigation, Response, Recovery – Getting the balance right.

"The Queensland Fire and Emergency Services is extraordinarily proud to host AFAC16 powered by INTERSHUTZ. This conference focuses on one of the most relevant questions in emergency management – are we getting the balance right?" said Ms Carroll.

More than 400 emergency managers and researchers attended the Bushfire and Natural Hazards Cooperative Research Centre's (CRC) Research Forum on the first day of the conference, with attendees learning new and innovative ways to keep communities safe from natural hazards.

Dr Richard Thornton, CEO of Bushfire and Natural Hazards CRC said the combined conference and research forum highlighted the importance of relationships between research and the emergency services.

"To have the connectedness that exists and continues to evolve between researchers and emergency management practitioners is fantastic. These critical relationships are increasingly important, and a key aspect of what the Bushfire and Natural Hazards CRC is about. These partnerships are more important now than ever as we continue to embed research findings into practice," said Dr Thornton.

Another popular element of the exhibition space was the 160 posters on display in the Knowledge Lounge. All the research posters are online at www.bnhcrc.com.au

For more information, go to www.afacconference.com.au

▼ Some of the 2300 delegates enjoying lunch in the exhibition hall.

Images courtesy of AFAC

Emergency response in Antarctica

Antarctica is the coldest, highest, driest, windiest and most desolate continent on earth. It is an exceptionally remote part of the world which is difficult to access, with vast distances between sparsely populated outposts. It may surprise you know that it is drier than any desert and nearly twice the size of Australia. Winds in excess of 320 km/h and temperatures below -80 °C have been experienced on the continent.

Martin Boyle

Martin Boyle is an internationally recognised Certified Emergency Manager® and responsible for field support and emergency management at the Australian Antarctic Division.

Australia maintains three permanent year-round research stations in East Antarctica at Casey, Davis and Mawson. During summer there can be between 40 and 100 expeditioners at each station. This shrinks dramatically to 15 or so hardy souls during the harsh winter months. The Australian Antarctic Division (AAD) is responsible for managing the Australian Antarctic Program operations and logistics which includes maintaining the stations and keeping expeditioners safe.

Traditionally everyone going south went by ship, however, these days it is possible to fly directly to Wilkins Aerodrome an ice runway near Casey station during the summer months in a matter of hours. The AAD uses an A319 jet to transfer expeditioners from Hobart to the continent where they may transit onwards to other stations using small fixed wing aircraft such as a Twin Otter (DHC-6) or Basler (DC3T). Helicopters (AS350 B3) are also used for transfers from ski landing areas to station and to support science projects. In the 2015-16 summer season the Royal Australian Air Force flew a series of C-17A missions into Wilkins which further enhanced the program medevac and logistics capability. The majority of expeditioners however still travel on the RSV Aurora Australis, the workhorse of the Antarctic Program which undertakes station resupply operations and marine science.

Despite the inter-continental aviation capability, in summer it can take up to two weeks to get assistance to any of the stations from Australia by air or ship. During winter it is almost impossible to access the continent except in the direst circumstances due to the extreme weather and impenetrable sea ice. Saying that, this assumption has been challenged recently with the dramatic evacuation of two United States Antarctic Program (USAP) expeditioners from the South Pole at the height of winter using a Twin Otter. In general, wintering expeditions are cut off from the outside world with only each other to rely on for survival for more than six months of the year.

▼ Stations and bases in East Antarctica.

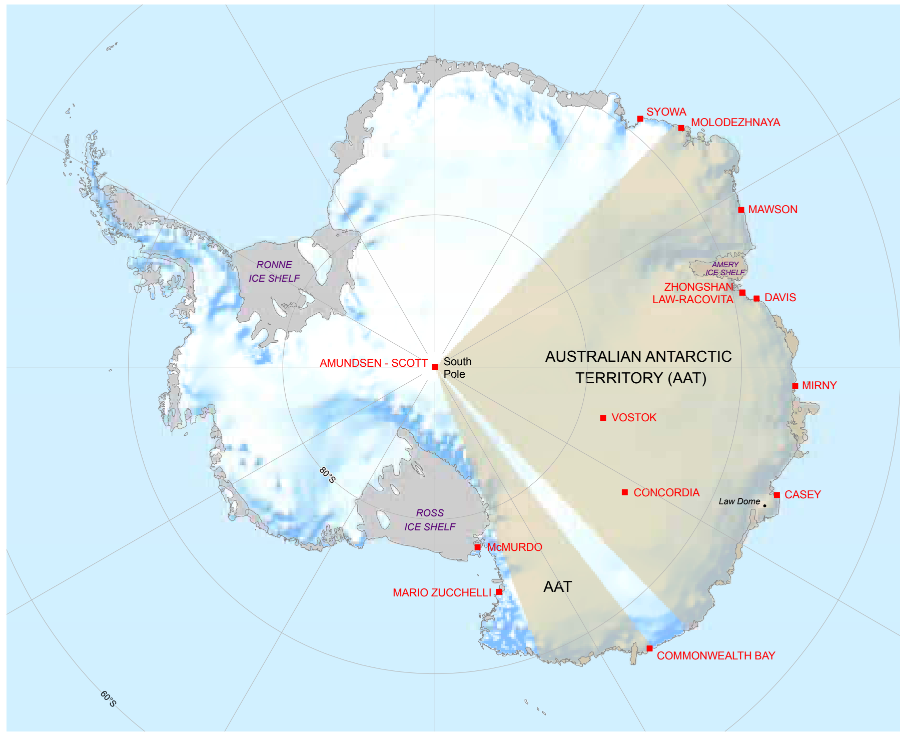


Image courtesy of Australian Antarctic Division

Image courtesy of Martin Boyle/Australian Antarctic Division

▲ Aerial view of Mawson station.

Crisis management and emergency response in Antarctica can be exceptionally challenging. There are 30 national programs with stations, bases and depots across the continent each with their own emergency management framework. The Council of Managers of National Antarctic Programs (COMNAP) brings together these nations to facilitate and provide opportunities to build relationships, develop systems, and exchange information. In 2004, COMNAP members developed the 'Framework and Guidelines for Emergency Response and Contingency Planning in Antarctica' which was a major step forward in multi-national cooperation and interoperability.

Mutual aid from other national programs across the continent can be essential during any emergency response. The Australian, French, Italian, Chinese, Japanese, Russian and Indian national programs have created the East Antarctic Emergency Coordination Group to share information on logistics and emergency coordination. It is a long standing principle that all Antarctic nations assist each other in times of need where practicable. The Antarctic community is relatively small despite the number of nations involved and assistance from other programs can be crucial for emergency response and evacuation across large geographical distances in such an extreme environment.

It is the remoteness of the Antarctic that makes Search and Rescue (SAR) a difficult proposition. The Australian SAR region covers an area nearly one-tenth of the world's surface. This includes the majority of the six million km² of the Australian Antarctic Territory (AAT). The Australian Maritime Safety Authority (AMSA) Rescue Coordination Centre (RCC) is responsible for any aviation response as far south as the South Pole and maritime response to the coast of Antarctica. The RCC is also the national monitoring centre for the COSPAS-SARSAT satellite distress beacon system. The AAD has a memorandum of understanding with AMSA which outlines the cooperation arrangements for response to major environmental incidents and search and rescue support. The AAD is responsible for coordinating SAR for its own activities in the Antarctic and where practicable responding to land based SAR incidents reported by AMSA including distress beacons from a land based source in the AAT. Given the huge area to cover, lack of resources and extreme weather the reality is that any rescue could take a long time and would most likely be a multinational effort.

This was the case on Christmas Day 2013 when a distress call was received from the MV Akademik Shokalskiy near Mawson's Huts at Commonwealth Bay. The resupply at Casey station was well underway and refuelling had commenced when the RSV Aurora Australis (AA) was tasked by the RCC to assist the vessel along with other national Antarctic program ships MV Xue Long, MV L'Astrolabe and USCGC Polar Star. The Shokalskiy was unable to make its way out of the pack ice and was being threatened by ice bergs with the possibility of having to abandon ship. It took five days for the AA to arrive on scene but it was unable to penetrate the thick sea ice to assist in breaking the ship out. Seven days after getting stuck 52 passengers were transferred from the Shokalskiy to the AA using a Chinese KA32 helicopter after a sea ice landing pad was created close to the ship. This was a truly multi-national response with the national programs of Australia, China, France and the United States sending assets to assist the beset vessel.

Image courtesy of Shane Ness/Australian Antarctic Division

▲ Mawson fire team 2016.

Image courtesy of Shane Ness/Australian Antarctic Division

◀ Mawson search and rescue team training.

The Australian Antarctic Program works on a strategic – tactical – operational model with coordination at the level appropriate to the size of the incident. During incidents that require logistical coordination, family liaison and media management the Crisis Management and Recovery (CMR) team at Head Office in Tasmania is activated. The CMR team not only manages overarching strategic response to the incident but also the logistical implications and season recovery for the Antarctic Program. On station and voyages an Incident Management Team (IMT) is stood up using the Australasian Inter-service Incident Management System (AIIMS). Each station has a multi-disciplinary Emergency Response Team (ERT) that responds to fire, SAR, fuel spill and medical incidents. Rostered teams of six expeditioners led by a Team Leader are on-call for a period of usually two weeks. A Fire Chief and SAR Leader are also chosen from the wintering team and are responsible for continuation training, maintaining equipment and team rostering.

Prior to deploying to Antarctica, wintering expeditioners receive two weeks of emergency response training in incident management, fire, and SAR. Some expeditioners may have developed prior skills sets with fire and emergency services or on previous deployments however most will be new to emergency response. When they arrive in Antarctica in addition to survival and field travel training they get a further seven days of land search and technical rescue taken by professional Field Training Officers. The technical SAR training is based on techniques taught by the Search and Rescue Institute of New Zealand (SARINZ). In 2007 the AAD, Antarctica New Zealand and the USAP developed a joint Antarctic Search and Rescue Training manual which supports interoperability in technical search and rescue across the programs.

The ERT continue their training throughout the winter with a series of drills and exercises across the various disciplines. Practicing a station muster is critical to the safety of all expeditioners. When the fire or SAR alarm is activated all expeditioners make their way to a central point and await instructions. Each person has a tag on the muster board that is colour coded. White for on and red for off station. As they assemble each person takes their white tag and those left on the board should all be red. In the event that an expeditioner is missing, a station search will be conducted, methodically searching each building and outlying area until they are found. Meanwhile the ERT does an initial investigation in the case of a fire or starts planning for a field SAR. Depending on the nature of the SAR a hasty team may deploy using quad bikes while the rest of the team follow up in a Hägglunds over snow vehicle. During the winter these vehicles are kept in a temperature controlled Emergency Vehicle Shelter. This means vehicles can be deployed immediately without the need to warm or deblizz them. Helicopters, fixed wing aircraft and inflatable rubber boats may also be used to support operations if conditions and availability permits.

Over the history of the Australian Antarctic Program the skills and attributes of these emergency response teams have been tested during many difficult missions. Incidents such as finding people lost in blizzards, responding to quad bike accidents, aircraft crashes, and vessel groundings in extreme conditions have provided challenges that are difficult for the uninitiated to comprehend. It is a testament to the courage and professionalism of Australian Antarctic expeditioners that they are able to respond to the demands of the Antarctic environment and assist those in need when called upon.

For more information, go to www.antarctica.gov.au

YONE PROEYE 751-SNR

SONAR Plus™

PAT.P

Search out by SONAR and pinpoint with the Underwater Camera Head! Great result in dark and cloudy waters!

With the unique PROEYE 751-SNR SONAR Plus , operators can see sonar images from the SONAR System and real-life images captured by the Underwater Camera Head at the same time. The forefront technologies built into SONAR provides clear images even when searching the dark or cloudy waters of lakes and rivers.

The system is designed compactly for optional use for various types of search & rescue operations.

GPS System indicates exact location on the display.

YONE CORPORATION
www.yone-co.co.jp

23, Nishinakaaicho, Nishinokyo, Nakagyo-Ku, Kyoto, 604-8441 Japan
Tel: +81 75 821 1185 / Fax: +81 75 801 2263

FDIC® INTERNATIONAL

APRIL 24-29, 2017

INDIANAPOLIS, INDIANA
INDIANA CONVENTION CENTER
& LUCAS OIL STADIUM

ANSWERING THE CALL FOR 90 YEARS

PRESENTED BY **Fire Engineering** OWNED & PRODUCED BY **PennWell®** FDIC.COM

INTERNATIONAL TRAINING & EXPO OPPORTUNITIES

FDIC International is the largest gathering of fire professionals in North America with 55 participating countries. Join attendees and exhibiting companies from around the world for a week of informative fire-focused meetings, workshops tours, an extensive program and exhibition. FDIC International highlights perspectives on the role of firefighters, and helps participants develop a vision to meet challenges and ensure the future sustainability of the industry

FDIC International Lounge

All international attendees are invited to take advantage of the official FDIC International Lounge, located in room 111/112 in the Indiana Convention Center. Translators, conference and event information local area information, etc. will be available

International Networking Reception

Join fellow international attendees and exhibitors for an evening of cocktails and appetizers at the International Networking Reception

FDIC® INTERNATIONAL

WORLD'S LARGEST
FIREFIGHTER TRAINING CONFERENCE & EXPO
INDIANAPOLIS, IN | WWW.FDIC.COM

WHERE LEADERS COME TO TRAIN

DEPARTMENT OF COMMERCE • UNITED STATES OF AMERICA

INTERNATIONAL
TRADE
ADMINISTRATION

PRESENTED BY **Fire Engineering®** OWNED & PRODUCED BY **PennWell®** **www.fdic.com**

Are F3 Foams an alternative to C6 AFFFs?

NO!

US Air Force leads the way converting to all C6 AFFF foams replacing PFOS, PFOA and long chain AFFFs with 418,300 gallons of 3% C6-based environmentally friendly AFFF, meeting 3% Mil Spec Mil-F-24385

dynaxC6

"One of the most far-reaching benefits to worldwide aviation safety" AFFF Firefighting Foams – containing C6 Telomer Fluorosurfactants since 1976.

* US Naval Research Labratories (NRL) website – 90 years of Innovation

"SEAC considers that fluorine-free foams can be taken into account on a long-term basis but cannot be relied on for the coming years for such a critical use."

Committee for Socio-economic Analysis (SEAC), Draft Opinion, on an Annex XV dossier proposing restriction on PFOA, its salts and PFOA-related substances, 10 September 2015, p14.

DYNAX CORPORATION
PO Box 285, Pound Ridge, NY 10576 USA
T 914 764 0202 techinfo@dynaxcorp.com
F 914 764 0553 www.dynaxcorp.com

dynax
FLUOROCHEMICALS

Firefighting foam concentrates – the constant evolution: Part 2

The foam concentrate is a mixture of different raw materials such as solvents, salts, corrosion inhibitors and mainly surfactants. In case of synthetic products, there are two types of surfactants: hydrocarbon chain, which are primarily responsible of foaming capacity and foam stabilization, and fluorinated, in which part of the hydrogen chain atoms are replaced by fluorine atoms. The fluorinated surfactants are the key component in AFFF agents because they bring to foams repellence and resistance to hydrocarbons. They add also the ability to form an aqueous film of only a few microns on hydrocarbons.

Javier Castro

Javier Castro has been in the fire business from 2001. He has led all R&D activities on firefighting foam concentrates for Auxquimia, from AFFFs to Fluorine free over more than 15 years. Over this period of time he has developed some special products designed for very specific applications. He has been directly involved not only in product development, but very active on technical consultancy, always very close to end user´s needs. Mr. Castro holds a chemical Engineer Degree from Oviedo University and he has been deeply trained over his career on QHSE, Finance and Management amongst others.

1. Environmental Regulations

Fluorinated surfactants can be manufactured by two processes, electro fluorination or telomerization. By using the first process, which is not longer used, it is generated products derived from PFOS (perfluorooctyl sulfonate), whose use in Europe is limited to proportions smaller than 0.005% by weight of finished products, according to European Directive 2006/122/EC. In the case of fluorinated surfactants produced by telomerization process, there is no specific regulation and are currently used as raw materials for AFFF agents manufacturing. Therefore, it is important to clarify that not all AFFF products are banned, but only those made with a specific type of fluorinated components.

Other fluorinated product which is subject to a special control by environmental authorities is PFOA (perfluorooctanoic acid). Although PFOA is not prohibited, nor it is a raw material to be used directly in foam manufacturing, there is a risk that the degradation of some fluorinated products generates this acid. The voluntary program from EPA "2010/2015 PFOA Stewardship Program," in which are involved the leading manufacturers of fluorinated products, aims to reduce fluorinated surfactants with chains of 8 atoms or more atoms mainly to chains of 6 carbon atoms (C6) before 2015. This way, it can be assured that any component degradation will not generate PFOA, since PFOA is a product with an organic chain of 8 carbons (C8).

During the last year, some proposals about regulation of PFOA levels has been proposed by different government; still not a clear desition since there is a lot of discrepancies about the achievable level that "makes happy" all the parties involved.

Apart from these international prohibitions and regulations, some countries are restricting also the use of any organohalogen components if they are likely to arrive ultimately to open waters, forcing many facilities to look for alternative solutions to AFFF agents, mainly in products without fluorine, which affects the performance considerably.

2. Fuels

Nowadays there is a growing amount of polar additives used in the composition of gasoline. The hydrocarbons can be extinguished with certain foams by violent application but polar solvents dissolve the foam when applied directly over the fuel. The mixture of hydrocarbons and polar liquids is an issue that should be considered by users because depending on the type and quality of foam the foam application techniques may be different.

Ethanol has been in recent times a fuel which demand has grown strongly, both for direct use or as an additive in gasoline. Nowadays the size of storage tanks containing this fuel is increasing. Ethanol must be treated as a polar liquid at the time of designing the fire fighting installation. The problem being when increasing the size of the tanks is to extinguish with portable systems (monitors), normally

Image courtesy of AUXQUIMIA S.A.U.

◀ Concern to protect the environment lead manufacturers to develop more biodegradable concentrates.

when there is a failure in the fixed fire fighting installation (frequent situation in case of explosion) since the direct application on the fuel is not possible.

The LNG (Liquefied Natural Gas) is another fuel that has gained importance in recent years, with large tonnages of LNG stored and transported by sea worldwide. Until now, protection of bunds of LNG is performed using high expansion systems, although some recent trials suggest that low expansion systems can be as effective with high performance foams.

3. Foam Concentrates

Due to the many changes in regulations, raw materials and fuels, the manufactures of foam concentrates have developed or modified their products to adapt them both legally and operationally to the market demands.

INCREASED VISIBILITY. INCREASED SAFETY.

FRC
A Safe Fleet Brand

inView 360™ Video System
Powered By Seon
Bird's-Eye View & Record

inView Guardian Package
5-Channel High-Definition Channel Recorder

High Def Cameras
Up to 6x better than analogue

GPS Mapping
View GPS on map without downloading video

The inView 360™ video system, Powered by SEON, and backed by Safe Fleet offers drivers a visibility solution for accident avoidance, equipment protection and pedestrian safety. Choose the specific telemetry package for your needs. This new system also features recording, Bird's-Eye view split screen, a full data management program, video playback software, GPS locations and mapping and more.

Contact your Safe Fleet representative to learn more about FRC, and watch the inView Video System in action at seonvideo.com.

ELKHART BRASS FOAMPRO FRC ROM
SAFE FLEET Emergency & Industrial

YOUR SAFETY. OUR MISSION.

26 Southern Boulevard • Nesconset, New York 11767
www.safefleet.net • +1.816.293.9040

Both the new AFFF agents, whose fluorinated surfactants are mainly C6, and the foams known as Fluorine Free (3F) have been lately the innovations and main lines of development for several manufacturers. The development of more concentrated products is also a trend in the market, in which products of 1% are very common in the petrochemical industry, far from the traditional 6%. Currently, there are on the market AFFF and AR-AFFF that can be dosed at 0.5%. The logistic advantages of these type of products in the case of large foam demands are evident with respect to traditional 3% and 6%.

Another trend is the increasing market demand for synthetic-based products (AFFF and AR-AFFF) compared to traditional protein (FP, FFFP and FFFP-AR). The best firefighting performance, better burn back resistance along with no-degradation over time are the key to success.

Fluorine Free foams have increased their popularity because of environmental restrictions in some countries. The foams without fluorinated components have existed for many years in the market (protein, multi expansion foams, Class A forest retardants, etc..) although it is also true that in the last decade synthetic fluorine products have been developed for Fire Fighting Class B, with the goal of being valid alternative to AFFF agents, but with less environmental impact. Until the appearance of this new generation of products without fluor, the forceful application of foams was only effective if AFFF products were used. However, some new Fluorine Free are also able to be used directly on hydrocarbons, although its behaviour and efficiency is still far from AFFF performance, especially when it is used with non-aspirating nozzles.

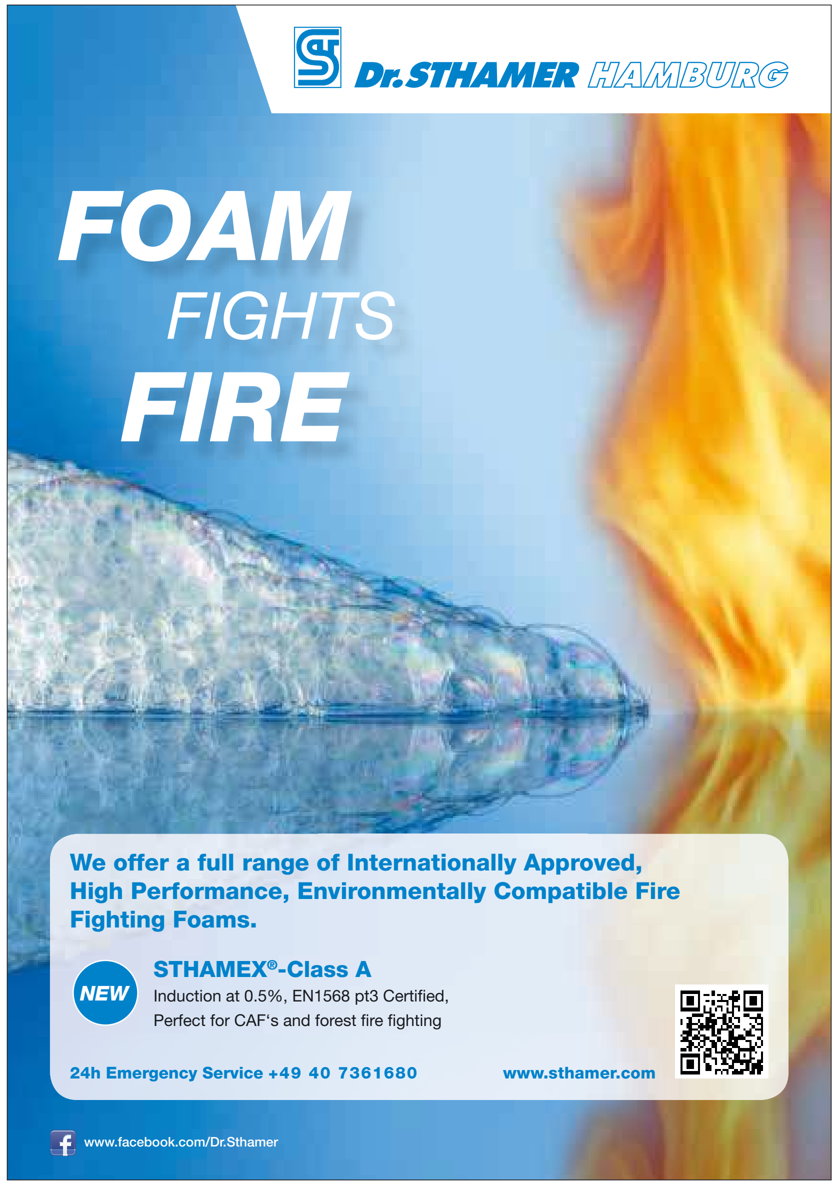
Despite of the significant progress reached in the development of this product range, still have some limitations and AFFF or FFFP foams are still not ready to be replaced without serious evaluation. Before replacing an AFFF or FFFP by a Fluorine Free foam, it is necessary to check if the new solution have the same certifications and ratings than the existing product. It is highly recommended to carry out a comparative fire testing with both products, evaluating the effectiveness of both in different applications, with the available resources in each case (proportioning, nozzles, etc..) and avoiding a simple "paper" comparison based on the documentation of the products.

4. Fire-fighting systems

The traditional proportioning systems are based on mechanical principles, designed for fixed working conditions (flow, pressures, etc.). This is the case of Venturi type inductors, membrane tanks, systems around the pump, etc. In addition to its low flexibility in terms of flow rates and proportion rates, they are not particularly precise in the proportioning. For this reason it is not recommended to use with high concentrated foam concentrates (less than 1%), where small error in the injected amount of product can represent a significant error in the proportion rate, which can generate consequences in efficiency, autonomy and economy.

Although foam concentrates (0.1-1%) have been traditionally used in Class A fires (solids), new developments have also allowed the use of AFFF and AR-AFFF products with at very low dosage rates (0.5%). In order to use these products with accuracy in the proportioning, it is strongly recommended the use of electronically controlled proportioning systems. A flowmeter is installed in the water line and this information is sent to a control unit, which controls the foam injection system, accurately adjusting the amount of foam required for each water flow. These equipment are very common in fire trucks, but can also be used in forest systems, fixed installations, etc.

Another important development in the sector has been the development and implementation of Compressed Air Foam Systems (CAFS), which are based on the



Dr.STHAMER HAMBURG

FOAM
FIGHTS
FIRE

We offer a full range of Internationally Approved, High Performance, Environmentally Compatible Fire Fighting Foams.

NEW
STHAMEX®-Class A
Induction at 0.5%, EN1568 pt3 Certified,
Perfect for CAF's and forest fire fighting

24h Emergency Service +49 40 7361680
www.sthamer.com

www.facebook.com/Dr.Sthamer

Electronic proportioning systems and CAFs allow to use highly concentrated products.

Images courtesy of AUXQUIMIA S.A.U.

injection of compressed air into the foam solution (water + foam), producing foam with uniform fine bubbles and excellent adhesion and cooling capacity. Since the foam is produced by the injection of compressed air is not necessary any restriction for the air intake at the nozzle, resulting in a large range with excellent foam quality. Better drainage times, faster extinctions, better burn back resistance, less water consumption, etc. are some of the characteristics of CAF systems.

Do we have to renew our stock of foam concentrate?

From the point of view of a user that has foam concentrates stored in his warehouse, it can be raised the question if it is convenient to renew his stock of foam in view of the many changes previously discussed. To carry out this evaluation it is necessary to ask the following questions:

Are we sure that our AFFF product is not formulated with PFOS?

If our stock of AFFF product is previous to 2000, it is necessary to ensure that it does not contain PFOS by carrying out a specific analysis of the fluorine compounds contained.

Does our product keep its characteristics and properties? ¿Have we done any analysis of the product since the purchase?

Some foam concentrates experience a reduction on its effectiveness over time. It is recommended to verify periodically the quality of the product.

Is our product certified according to standard EN-1568:2008 with the required classification?

The standard EN-1568-3:2008 is the reference standard in Europe and we must know the classification of our product both with hydrocarbons (EN-1568-3:2008) and with polar liquids (EN-1568-4:2008). Depending on the classification of the product, we must evaluate if our firefighting equipment is suitable to be used with the existing foam concentrate.

Does our product comply with other standards that can be important for our risks?

If the foam concentrate is going to be used for fires in storage tanks, airports, etc. where there are specific regulations, it is recommended to confirm the compliance with these regulations by carrying out the corresponding tests.

Is the proportion rate the most adequate for our interests?

The foam concentrates has progressed towards a reduction in the proportion rate, from the traditional products 6% to most modern ones 0.5%. In some cases the foam concentrates have only a single proportioning rate for hydrocarbons and polar solvents (1%, 3% and 6%), but in other cases the proportioning rate change depending on the fuel (0.5x1, 1x3 and 3x6). If it is necessary to protect both against hydrocarbon and polar solvents fires, the most convenient option is to have a product with one only dosage rate to avoid mistakes during firefighting operations and especially in the case of a fire brigade whose type of emergencies are very different.

Is our product effective with all the fuels and risks we have to attend?

Most of the standards use heptane as reference fuel for hydrocarbons fires, and acetone and isopropyl alcohol for polar liquids fires. Moreover, they generally use aspirating nozzles (excepting standard UL-162). Thus, it is possible to compare the effectiveness of different products in constant conditions. It is likely that the real fires are with other fuels such as diesel oil, gasoline, kerosene, ethanol, methanol, etc. or even a mixture of these fuels, hence we must be sure that our foam concentrate is capable of extinguishing and protect effectively against all types of fuel with the firefighting equipment available.

Is it suitable our foam concentrate to be used with our firefighting equipment?

We must know what is the real performance of our foam concentrate when operates together with our firefighting equipment. Firstly, we must verify that the proportioning system is suitable to be used with our foam concentrate, and especially if the product is pseudoplastic such as AFFF-AR or Fluorine Free products, due to their high viscosity at low temperatures. It is also important to know the foaming capacity of our foam generators (low, medium or high expansion).

For more information, go to www.auxquimia.com

2017 Williams Fire & Hazard control APAC Xtreme Fire School Rayong, Thailand

WILLIAMS FIRE & HAZARD CONTROL

Williams Fire & Hazard Control presents the world renowned Xtreme Industrial Fire & Hazard Training School. For the first time, we will be running this school in the Asia-Pacific Region.

Learn Petroleum Oil and Gas (P.O.G) Xtreme firefighting techniques, fire behaviour, equipment applications (fixed and ER Mobile), chemical agents, and incident recognition, command and control through hands on firefighting and real world case studies.

The course is delivered by the Williams Fire & Hazard Control world class industry leading experts, who will share with you their knowledge from 35 years of experience in successful fire and hazard management, control and extinguishment.

Having fought over 200 of the industry's most threatening flammable liquid fires, successfully, this is your opportunity to learn from those that have been there and done that.

Experience... is the difference

"When faced with fires at petroleum, oil or gas facilities we have learned that it is experience that makes the difference and this course can be the perfect opportunity to gain that experience."

Chauncey Naylor,
Director for Training & Emergency Response Operations at Williams Fire & Hazards

Xtreme INDUSTRIAL FIRE & HAZARD TRAINING

16–19 January, 2017
Rayong, Thailand

For more information and to register, please visit:
www.williamsfire.com

tyco Fire Protection Products

www.williamsfire.com

Copyright © 2016 Tyco Fire Products LP. All rights reserved.

Improving survival for ‘out of hospital’ cardiac arrest

Cardiac arrest occurs suddenly and often without warning. The opportunity to change the outcome for the patient lies in the actions taken in the first few minutes after collapse. CPR, defibrillation and advanced life support can save lives. Survival from Out of Hospital Cardiac Arrest (OHCA) is regarded as a key marker for the clinical quality of any Emergency Medical Service (EMS). In many countries, including Australia, Fire Fighting personnel support Paramedics to deliver basic life support in time critical situations.

Michelle Murphy

Michelle Murphy is an Intensive Care Paramedic and Clinical Support Officer with Ambulance Victoria. She is passionate about pre-hospital care delivery and involves herself with the training & education of paramedics, fire personnel and life savers. Michelle is currently on the Board for the Australian Resuscitation Council Victorian Branch and Life Saving Victoria.

In late 2015 Michelle was awarded an ‘Emergency Service Foundation Scholarship’ which took her to the US to observe the prehospital management of OHCA and since returning has assisted develop OHCA packages targeting key opportunities within AV to improve survival from Out of Hospital Cardiac Arrest. Michelle hopes to continue with research into this area looking at optimal ways to train to ensure knowledge retention and skill maintenance over time.

Improvement in survival from OHCA requires a system wide and team based approach from those involved in the delivery of care. This paper is based on an observational study of different EMS systems in the US and personal experience in Victoria Melbourne, where EMS providers have worked together to achieve measurable improvements in survival from OHCA in their communities. They all demonstrate continuous improvement through analysis of their system then structured deliberate changes to their call taking, their training their performance and the system of care for those experiencing OHCA.

The chain of survival describes the key actions that ensure the delivery of care known to give patients the greatest opportunity for survival. There are many factors that contribute to the outcome for each individual, some of these such as age, co morbidities and event factors are out of the control of those providing EMS. The chain of survival with its 5 links of early access, early CPR, early defibrillation, early ALS, and early post resuscitative care highlight the critical factors that are essential for any system to deliver a comprehensive system of care.

It is easy to look at the chain and conceptually understand what needs to be done each step of the way. The difficulty is often linking the steps and supporting each other to work together. The outcome for each patient is linked back to the individual performance of those undertaking each component of care. To achieve the best outcomes in OHCA the organisations that deliver each link in your system must be accountable for the role they play and be committed to work together. Success lies not just in achieving each link within your system of care, but will come from leadership and a culture of excellence. Accountability, quality training and measuring performance in each organisation will drive any organisational change that will improve the system.

Data

Well performing EMS systems around the world are achieving survival rates for unwitnessed OHCA (shockable rhythms) upwards of 60% yet in other locations survival is as less than 10%. How do we know this? Because the first step to improving something is to measure it. Internationally the Utstein template is used to measure and report on OHCA survival. We know that OHCA is a time critical event, therefore measuring the time it takes to respond, to arrive, to provide CPR, to apply the defibrillator etc. will give you a baseline for benchmarking with best practice and will give you a starting point from which you can apply an intervention and measure the difference. Data and measuring performance are key to any improvement in outcomes. Ongoing data capturing will guide system changes and support quality improvement. Training/identifying your own systems and then challenging the system to get better if there are weaknesses in the link is where the real success lies.

Culture

There are many differences in EMS systems and communities around the world and driving change can be complex. Those systems that were performing well and who continued to drive performance improvement were those who had leadership which transformed the culture in the organisation. Leadership is crucial to any culture of excellence. The underpinning desire to save a life and do whatever it takes to be the best at saving the life. In those systems where OHCA was considered a survivable event each component of the system linked together and each group within the system was driven to do their part the best. Whether it was the 74% of bystanders doing CPR, or the call taker recognising cardiac arrest and instructing CPR over the phone or the EMS personnel doing CPR, they all believed that could contribute to saving the person’s life. What contributes to outcomes for patients is the actual performance of the call taking staff, the fire personnel, and the paramedics.

For the call taking staff and those performing the resuscitation successful resuscitation will not just come through following a guideline or protocol, but through measuring how you perform, comparing this with what the best looks like, then practicing and continuing to improve your performance.

One of the most valuable tools for improvement is to use objective measured feedback on your performance, compare this to where the current world’s best practice is and then train/practice to strive to be the best. When staff do perform well, feedback and recognition of a job well done are simple measures that drive a culture of ensuring everyone feels part of the team and is accountable for the outcome.

As an organisation in order to be the best you need to believe that OHCA (from shockable rhythm) is a survivable event, this comes from a strong belief in their system, their teams, along with being competitively driven to continue to improve. The only way to improve is to practice what you do.

Image courtesy of Resus Academy

▲ Paramedics from around the world training at the Resuscitation Academy – Seattle.

Dispatcher Aided CPR

The culture of belief needs to start with call takers. A system that includes Dispatcher Aided Resuscitation Training (DART) sets up the system for success from the start. Early CPR (within the first few minutes) is impossible for any EMS agency to provide no matter how good their response times, therefore recognising the cardiac arrest, dispatching an EMS response and instructing someone to perform CPR is crucial to patient outcomes. Recognising cardiac arrest can be quite challenging for the call taker. Coaching, supportive training and ongoing feedback are essential. It’s not just about telling someone to do CPR, but it’s about taking control of a stressful situation over the phone and instructing them (sometimes quite aggressively) to start CPR. Most call centres instruct compression only CPR which is endorsed by the International Liaison Committee on Resuscitation.

Image courtesy of Ambulance Victoria and Metropolitan Fire Brigade

▲ **Emergency Medical Response is a collaborative program between Ambulance Victoria and the MFB designed to improve survival from cardiac arrest. MFB firefighters co-respond with the nearest ambulance and can manage unconscious, non-breathing and pulseless patients by providing access to life-saving emergency care.**

CPR and Defibrillation

High quality chest compressions with minimal interruptions and early rapid defibrillation underpin successful resuscitation. Different organisations have tried varying the ratio of ventilations and compressions in their CPR as well as interposing the ventilations and compressions to reduce the time off the chest, however recent published data and has demonstrated no difference in long term outcome. What does make a difference is the quality of performance by the rescuers.

Quality training with immediate feedback allows the rescuer to modify their practice immediately to improve performance. Over time, access to quality equipment and regular training with objective feedback allows the rescuer to refine and improve their performance. There are plenty of devices and manikins to aid quality training as well as devices that provide real time live feedback on compression performance during cardiac arrest. Real time feedback both in regular training and in the operational setting have led to improved performance.

Defibrillation is the 3rd link in the chain of survival. The availability of Automatic External Defibrillators (AEDs) all over the community over the last 10 years now brings this part of the resuscitation into the public domain. Call takers standard questioning is to ask whether there is an AED nearby for all cardiac arrest events. The challenge is not so much how many AEDs you have in your community, but rather how do you integrate their deployment to the patient who needs one? Some systems have integrated this into an AED registry linked with their dispatch system, others make them available on an app where a trained responder (off duty) can be notified if they are within a few hundred meters of a cardiac arrest, to assist with CPR and defibrillation. The system will allow the trained bystander to be notified where the closest AED is available and where to take it to the patient in need. Integrated technology is really challenging the way we engage with our community to drive improvement and that all important response to someone in cardiac arrest.

There is no single magic easy fix to improving survival from OHCA. There are many variables and multiple organisations that are accountable for each component that needs to happen for the patient to survive an OHCA. Frequent training, measuring performance and feedback drove ongoing practice and training to get better.

As a wise person (Dr Michael Sayre) once told me “It takes a system to save a life”. The science behind improving survival from OHCA is not difficult, but it’s not simple. This is an opportunity for you to take a look at the organisation you work in, and think about what you can do from the ground up better to improve the outcome for the people in your community.

For more information, go to www.resuscitationacademy.org

afac17
powered by INTERSCHUTZ

Collaborating for Success
Improving performance in emergency management

INTERNATIONAL CONVENTION CENTRE
DARLING HARBOUR, SYDNEY
4 – 7 SEPTEMBER 2017

afacconference.com.au #afac17

afac
bushfire&natural HAZARDSCRC
Deutsche Messe

TENMAT
FIRE PROTECTION SOLUTIONS

MADE IN BRITAIN

Winner of the Queen’s Award for Innovation and International Trade

Firestopping for External Cavities

- Maintains air gap for ventilation
- Expands in a fire situation to provide compartmentalisation
- Tested within a vast range of construction types
- Available worldwide

+44 (0)161 872 2181 www.TENMAT.com passive.fire@tenmat.com

3M
Novec™

3M™ Novec™ 1230
Fire Protection Fluid

Protect what matters.

You're not just safeguarding people, buildings, equipment and operations from fire, you're helping preserve the world we live in. Protect what matters. All of it.

Novec 1230 fluid revolutionized the fire protection market 15 years ago. Today, with more than 50,000 system installations in over 90 countries, we continue to move the industry forward with the purpose of delivering a solution that is designed to work now and for years to come.

A smart, safe, sustainable alternative to HFCs, inert gas, water mist and CO_2, Novec 1230 fluid works quickly, cleanly and efficiently to help stop a fire before it starts.

Approved systems designed for Novec 1230 fluid available worldwide.

novec.sg/novec1230
innovation.sg@mmm.com

3M Science. Applied to Life.™

3M and Novec are trademarks of 3M. © 3M 2016. All rights reserved.

Gaseous fire suppression systems – understanding safety measures

Understanding how the extinguishing agents in your gaseous fire suppression system are regulated under national law has many benefits including protecting your workers and the environment. Commercial and industrial premises have many types of fire protection systems and equipment. These are for the most part, provided to meet the mandatory life safety measures required by law.

Brett Staines

In relation to fire equipment and systems, Australian Standards (AS) specify installation procedures and the correct location of fire extinguishers, among other things, and state that all fire equipment and systems including gaseous fire suppression systems are to be regularly tested, serviced and maintained. AS 1851 Routine service of fire protection systems and equipment sets out these requirements.

The objective of AS 1851 is to maximise the reliability of fire protection systems and equipment such that the systems and equipment meet the requirements of the relevant design, installation and commissioning standards and are likely to continue to do so until the next scheduled activity.

Due to the large number of Acts and Regulations regarding fire safety requirements that may apply, it would be advisable to check with local authorities.

Owners also often install additional systems voluntarily, or at their insurer's insistence, to further reduce risk to property. Gaseous fire suppression systems typically fall into this non-mandatory category. Gaseous fire suppression systems are installed widely throughout the building industry sector to protect facilities such as:

- computer rooms and data centres,
- switch rooms and motor control centres,
- process equipment,
- other business critical assets and systems.

▼ Australian Standard AS 1851 sets out the requirements for the routine servicing of fire protection systems and equipment.

Image courtesy of Fire & Security Products, Australasia

Brett Stains is Technical Development Manager, Fire & Security Products, Australasia, UTC. FPA Australia TAC 11/22 Chair and Australian Standards Special Hazards Committee Chair.

Image courtesy of Fire & Security Products, Australasia

▲ **Gaseous fire suppression systems are installed widely throughout the building industry sector.**

These systems are typically installed so as to:

- protect high value assets,
- guarantee business continuity,
- safeguard people and processes.

Gaseous fire suppression systems are extinguishing agent storage cylinders coupled to a network of discharge pipework and nozzles that deliver the extinguishing agent to the room to be protected. They are typically installed with dedicated fire detection and control systems which provide an automatic discharge if a fire starts.

The extinguishing agents used in these systems are also sometimes referred to as clean agents because they don't leave any residue after discharge. This makes them particularly suited to protect delicate equipment, documents or artefacts.

There are two broad groups of gaseous extinguishing agents:

- Inert gases – are naturally occurring gases such as nitrogen, argon, carbon dioxide or combinations of these. They extinguish fires by reducing the available oxygen to a level below that which a fire needs to burn (typically less than 15%).
- Synthetic gases – are manmade manufactured gases and they extinguish fires by reducing heat and using chemicals to interfere with the fire chain reaction.

Both types of gaseous extinguishing agents have their own advantages and disadvantages. This means that choosing the most suitable fire extinguishing agent for a specific application will depend on a range of factors including their impact on the environment.

Environmental benefits due to the implementation of a national licensing system for the fire protection industry

One environmental consideration which building owners and those responsible for maintaining gaseous suppression systems should take into account when making a decision is whether the extinguishing agent used in their system are scheduled under the Ozone Protection and Synthetic Greenhouse Gas Management Act 1989 (the Ozone Act) and the Ozone Protection and Synthetic Greenhouse Gas Management Regulations 1995 (the Regulations). Scheduled extinguishing agents are those listed in the Ozone Act and include those synthetic gases that deplete stratospheric ozone, ozone depleting substances (ODS) agents that contribute to global warming and synthetic greenhouse gasses (SGG).

To minimise their environmental impact, the discharge of scheduled extinguishing agents, for anything other than putting out a fire, is strictly controlled. The Ozone Act and the Regulations govern the acquisition, possession, handling, use, storage and disposal of scheduled extinguishing agents used in the fire protection industry in Australia. The Regulations mandate the licensing of technicians who work on systems containing scheduled extinguishing agents.

In order to protect the environment, it is very important that all facility owners understand the potential environmental impacts of ODS and SGG if released into the atmosphere. To learn more about the effects of ODS and SGG, please visit the Department of the Environment and Energy website: http://www.environment.gov.au/protection/ozone

It is mandatory that systems using synthetic gases are installed and serviced by an appropriate licensed technician under the Regulations. The Board strongly recommend correctly servicing and installing of all fire protection systems and equipment by trained and licensed professionals.

So which gaseous fire extinguishing agents are classified as scheduled extinguishing agents?

In the commercial/building sector the most common scheduled extinguishing agent in use is known by the trade names FM-200® or FE-227™. NAF S-III and NAF P-III are the trade names of other common scheduled extinguishing agents which are still present in some older systems. While FM-200 and NAF S-III are the most common scheduled fire extinguishing agents there are others.

Under the Ozone Act, a scheduled extinguishing agent can only be discharged where the product containing the extinguishing agent is being use for its designed purpose. This will generally be in response to an actual fire. Discharge for testing or training is not permitted unless the person meets the requirements in the Regulations and has been granted a fire protection industry permit to do so by the Fire Protection Industry (ODS & SGG) Board (the Board).

THE MOST EXPERIENCED MANUFACTURER
OF SPECIAL HAZARD FIRE PROTECTION SOLUTIONS

Our team of specialists provides support
to our global distribution network.

JANUS
FIRE SYSTEMS®

Providing the Most Efficient Package For Clean Agent Delivery Systems.

CLEAN AGENT FIRE EXTINGUISHING SYSTEMS • 3M™ NOVEC™ 1230 FIRE PROTECTION FLUID
LOW & HIGH PRESSURE CO2 • ENGINEERED DRY CHEMICAL • FOAM • AIR SAMPLING • ALARM & DETECTION

FM APPROVED UL LISTED +1 219-663-1600 www.janusfiresystems.com

HD FIRE PROTECT®

Our Global Philosophy of growth is summed up in one word
Trust
Serving over 50 countries worldwide

WATER SPRAY NOZZLES

Manufacturing Excellence
Superior Performance
World-class Fire Fighting Products

DELUGE VALVES

ALARM VALVES

FIRE SUPPRESSION FOAMS, EQUIPMENTS & SYSTEMS

MONITORS

HD FIRE PROTECT PVT. LTD.
D-6/2, Road Number 34, Wagle Estate, Thane 400604, India
Tel: +(91) 22 25182600 Fax: +(91) 22 25182602 Email: info@hdfire.com
www.hdfire.com

The main gases are

Product name	Uses	Other name
FM-200® FE-227™	Function as total flooding agents. Typical applications could include chemical storage areas, clean rooms, communications facilities, laboratories, museums, robotics and emergency power facilities.	Heptafluoropropane HFC-227ea
Halon-1211	Typically used as a streaming agent. Requires a Halon Special Permit in Australia	Bromochlorodifluoromethane BCF
Halon-1301	Typically used as a total flooding agent. Requires a Halon Special Permit in Australia.	Bromotrifluoromethane BTM
NAF-P-III	Typically used as a streaming agent. It is: A replacement for Halon-1211. Effective on Class A, B and C type fires.	HCFC Blend C
NAF-S-III	Typically used as a total flooding agent. It is: A replacement for halon-1301. Effective on Class A, B and C type fires.	HCFC Blend A

▲ **Note: Inert gas fire systems that use argon, nitrogen gases, carbon dioxide, water mist etc. are not covered by the Ozone Act. However, the inclusion or omission of any extinguishing agent product from this list does not confer any form of endorsement or lack of endorsement of a product. The list simply identifies whether the Ozone Act applies to that product.**

Halon Agents – Essential uses

Halon agents (Halon 1301 – used in fixed systems, and Halon 1211 or BCF – used in portable extinguishers), are not permitted for anything but approved "essential use". Essential uses involve situations where the halon is being used for a purpose that is necessary to protect human life or operate equipment that is critical to the community and there is no practicable and safe alternative to halon that is available at a reasonable cost and is likely to result in less damage to the environment. A Halon Special Permit granted by the Board is required in such cases. Essential uses are typically restricted to aviation and military applications. As a consequence, halon systems and BCF portable extinguishers must no longer be installed or used in building/commercial premises. If you are aware of a halon system installed in your facility (easily identified by its yellow cylinders) you should arrange for the system to be decommissioned and the cylinders sent to the National Halon Bank for disposal (Please call 1800 658 084).

Awareness and understanding of the use of systems and equipment

The building industry sector primarily uses FM-200 with some minimal use of NAF S-III. The use of FM-200 is due to its ability to act as a leading alternative to halons with the added benefit that FM-200 leaves no significant post discharge clean-up, obstruction on discharge or damage to sensitive equipment.

It is important that building owners, facilities managers and building occupants are aware if any gaseous fire suppression systems are installed within their building or facility to minimise the risks of discharges due to human error or equipment malfunction attributed to lack of adequate maintenance or understanding of the system.

So how can you identify one?

Rooms protected by gaseous fire suppression systems typically have warning signs installed on or above doorways into the room and close to other items of equipment which form part of the system.

If you work in a room protected by a gaseous fire suppression system it is important you understand how the system works. Some of the controls installed as part of the system are to allow the system to be discharged manually, if required in

HAES

256 Zone
Conventional Fire Systems

ESENTO

LPCB
LOSS PREVENTION CERTIFICATION BOARD

✓ 2 - 32 zone panels available
✓ Network up to 8 control panels to provide up to 256 zones
✓ LCD Remote Display Unit reports all network wide fires & faults

From Land to Sea
We've Got You Covered

ESENTO MARINE
New Marine approved conventional fire alarm control panels

Find out more:
T: +44(0)1895 422066
E: international@haes-systems.co.uk
www.haes-systems.com

We help suppression system OEMs meet regulatory standards with superior electromagnetic solutions.

Call us with your challenge.

- ULTRA-FAST RESPONSE
- HIGH DURABILITY
- RESETTABLE
- ROTATES FOR EASY INSTALLATION
- UL RECOGNIZED COMPONENTS
- INTEGRATED SUPERVISION FUNCTION
- FULLY ENGAGED INSTALLATION DETECTION
- MEETS UL & NFPA WIRING CODES AND STANDARDS
- ACTIVE MONITORING
- MEETS REQUIREMENTS OF NFPA 2001: SEC. 4.3.4.1
- CUSTOM CONFIGURATION
- AND MORE...

TLX TECHNOLOGIES

COME VISIT US AT
Intersec 2017
Jan. 22-24, Dubai, UAE
Booth #4-H16

CONTACT US:
+1 262-372-2165
www.tlxtech.com

© Image courtesy of Fire & Security Products, Australasia

◀ **Gaseous fire suppression systems are often installed to protect high value assets such as data centres.**

an emergency. Obviously these controls should only be operated in response to a fire. If you are not sure what a control does – don't touch it. It is also important to remember that most of these systems will operate automatically if fire or smoke is detected, so any activity which may cause the detection system to go into alarm (such as soldering or other activities which create clouds of dust or smoke) must not occur unless the gaseous fire suppression system has been isolated.

If you need training on how the gaseous fire suppression system installed in your facility works, speak with your supervisor or contact the fire service provider that maintains your system.

The Board has developed a factsheet covering the building industry sector including information specific to licensing requirements and risks associated with scheduled extinguishing agents. A copy can be downloaded from the Board's website on www.fpaa.com.au/ozone.

Regular servicing and maintenance of gaseous fire suppression systems is essential, not only to ensure the system is fully functional in the event of a fire but also to ensure the safety of those working within the protected area.

Extinguishing agents are stored in cylinders under very high pressure. If these cylinders are not properly handled and maintained they can pose a significant safety risk due to the amount of stored energy contained within them. There have been cases of people being severely injured and even killed when cylinders have been accidentally discharged or mishandled.

In addition to the risks to health and safety, discharge of some scheduled extinguishing agents can also have detrimental environmental effects.

For these reasons it is very important that only competent, trained and in the case of scheduled extinguishing agents, licensed technicians (with the appropriate Extinguishing Agent Handling Licence (EAHL)), be allowed to install and maintain gaseous fire suppression systems. Under Ozone legislation, any person working on a gaseous fire suppression system that may cause the discharge of a scheduled extinguishing agent must hold an EAHL. Different entitlement types of EAHL cover specific activities such as system installation, testing, maintenance and the recovery, reclamation, filling and recycling of scheduled extinguishing agents.

The Fire Protection Industry (ODS &SGG) Board

The Fire Protection Industry (ODS & SGG) Board appointed by the federal Minister for the Environment, administers the fire protection division of the Regulations on behalf of the Australian Government. The Board exercises a range of powers and functions listed in sub regulation 311(2) in all states and territories in Australia, including to:

- receive applications and application fees for fire protection industry permits
- process applications within the 30 day time frame specified in the Regulations
- issue fire protection industry permits in accordance with the Regulations
- inspect premises as specified in the Regulations.

The Board also undertake the following functions outside of the requirements of the Regulations:

- provides customer service support to members of the fire protection industry and the general public
- provides a program of communication and awareness activities aimed at encouraging compliance with the fire protection industry permits scheme.

The Board provides ongoing information to the fire protection industry and the general public on its activities and purpose. This improves the awareness and understanding of scheduled extinguishing agents, the legislative requirements surrounding them and the need to reduce their use and the potential risk for accidental emissions. For a gaseous fire suppression system to operate effectively and efficiently, the Board recommends that:

- Owners of gaseous fire suppression systems use a maintenance log book to record all maintenance activity. The use of logbooks will establish a process for documentation and provide a full life-cycle chain of custody documentation for all installed systems. A log book would record all maintenance activity and record the details of the licensed technician who is servicing the system.
- Ongoing maintenance of systems to greatly improve the efficiency and longevity of the system.

The Board has also published the Ozone Depleting Substances and Synthetic Greenhouse Gases (ODS & SGG) Good Practice Guide and a building industry factsheet. If your facility has a gaseous fire suppression system, which contains scheduled extinguishing agents you are encouraged to download a copy of the Good Practice Guide and the factsheet from www.fpaa.com.au/ozone. The guide and factsheet provides additional information on your obligations under the Regulations and further details on the issues discussed in this article.

For more information, go to www.fpaa.com.au/ozone

FIRETRACE®
POWER TO INNOVATE. FLEXIBILITY TO ADAPT.

WHATEVER THE HAZARD,
WE'VE GOT YOU COVERED

PRE-ENGINEERED SYSTEMS FOR SMALL SPACES:
- Detect and suppress fires automatically
- Reacts 10x faster than conventional systems
- Compatible with most extinguishing agents

UL LISTED FM APPROVED CE
Listings and approvals vary by agent and system type

ENGINEERED SYSTEMS FOR LARGE SPACES:
- Both UL listed and FM approved systems available
- High-pressure performance in a low pressure system
- Unparalleled flexibility in system design and placement
- Cylinder sizes ranging from 35lbs to an industry leading 1300lbs using 3M™ Novec™1230

LEARN MORE AT: www.firetrace.com
A HALMA COMPANY

FIRETRACE INTERNATIONAL - WORLD HEADQUARTERS
8435 N. 90th St., Suite 2, Scottsdale, AZ 85258, USA.
Tel: +1 480 607 1218 • Email: info@firetrace.com

FIRETRACE INTERNATIONAL LTD - EMEA OFFICE
Unit 11, IO Centre, Salbrook Road, Salfords, Surrey, RH1 5DY, UK.
Tel: +44 (0) 1293 780 390 • Email: info@firetrace.com

Women and Firefighting Australasia 2016: Right place. Right time

In November 2015, during his swearing in ceremony, the Canadian Prime Minister Justin Trudeau made a statement about how his new cabinet 'Looks like Canada today.' When asked why was it so important to have a cabinet with a gender balance his reply was succinct: 'Because it's 2015'!

Ange Pestell

Steve O'Malley AFSM

Ange Pestell is the Board Secretary for Women and Firefighting Australasia Inc. (WAFA).

Steve O'Malley is operational Fire fighter with more than 27 years' experience, the last nine as a Multicultural & Indigenous Liaison Officer with the Metropolitan Fire Brigade.

As much as that made the world sit up, take notice and praise Trudeau and his new style of inclusive leadership, we had heard this same simple statement a year earlier. At the 2014 Women and Firefighting Australasia Inc. (WAFA) conference held in the ACT, two Fire Service Commissioners made a point during their presentations that they would '…put in place measures to ensure parity in the recruitment process for their respective services.' One could be forgiven for thinking that that's nothing new. 'We've heard it all before.' It's to be expected: the head of an Emergency Services organisation drops in at another Emergency Services conference, looks at the theme and says exactly what the delegates want him to say. End of story!

Not Quite. But let's see how far we've come!

Women and Firefighting Australasia Inc was established as Women in Fire Fighting (Australia) in 2005. In May that year, the inaugural Women in Fire Fighting (WIFF) Forum was held at the Holiday Inn at Sydney Airport to celebrate a century of Australian female fire-fighting and to broach issues often considered but seldom publicly discussed: Fire Service diversity and inclusion. The convenor of that event was Dr Merilyn Childs, who currently maintains one of the most important digital archives relating to diversity in fire-fighting in Australia and is a life member of WAFA. It must have been challenging for Merilyn to pull together enough delegates to discuss their passion for fire-fighting, the historical significance of the occasion, as well as what the future had in store for the women who would follow in the footsteps of Australia's pioneering female fire-fighters, the Amazons 1901-1903 and the Women's Fire Auxiliary 1941-1945.

Typical of forums of this type, one of the features of WIFF 2005 was the keynote presentations by the then Assistant Commissioner of the NSW Rural Fire Service, Mark Crosweller AFSM and Pru Goward, in her capacity as Sex Discrimination Commissioner at that time. Pru's rally cry, 'Firing Up Women' pulled no punches as she made the case for the need for 'diversity and inclusion' in the emergency management sector and made it clear that if you can get gender inclusion right, then the rest would follow.

▼ Participants of WAFA's team at the Wollongong Miss Muddy event in 2015.

Image courtesy of WAFA

Galvanised by the combination of historical sentiment, good will and opportunity to network and share stories with colleagues who, although coming from a myriad of settings, share a passion for fire-fighting, plans for the 2006 Women In Fire Fighting Conference commenced.

Over the course of the last decade WAFA has morphed into a significant point of contact for emergency services organisations that want to strengthen their particular recruitment and inclusion strategies. Each of WAFA's biennial conferences has been themed to encapsulate their vision, which is to 'Promote and Celebrate Women in Firefighting'. Conferences have been held in Sydney in 2006, Victoria's Yarra Valley in 2010, Adelaide in 2012, Canberra in 2014, and the latest in Brisbane in August 2016. Speakers at WAFA conferences range from Human Rights Commissioners to Fire Service Commissioners and every rank and role throughout member organisations. Keynote presentations are delivered by a variety of supporters, with an emphasis on positivity, empowerment and motivation.

In 2014 WAFA incorporated a Hands On Training (HOT) component to the conference program, affording delegates an experience to develop skillsets and discover equipment they may not have encountered previously. These sessions included large animal rescue, road crash rescue techniques, urban search and rescue, live fire exercises, and manual handling and lifting techniques.

The journey between 2006 and 2016 was by no means smooth, but the spirit of the mission of the collective has definitely remained consistent. WAFA (WIFF) is about celebrating the many facets that women bring to the Fire Fighting sector, in all of their diverse forms. WAFA's focus has never been an industrial one. The focus is on leadership, healthy fellowship, operational and non-operational decision-making, ethics, human rights, personal and crew accountability, and family. This is regardless of rank or role, employment status and organisational affiliation. Members are volunteer and career, operational and corporate, strategists, researchers, and land management, forestry, and air services personnel. They come from our capital cities and our remote and rural country towns. WAFA members are from every State and Territory in Australia, New Zealand, Papua New Guinea, and Samoa, and as far as the UK and USA. WAFA membership is not gender exclusive and is truly diverse.

Image courtesy of WAFA

▲ A rural female firefighter mopping up after a bushfire. WAFA promotes firefighting as a viable career or volunteer choice for women.

Is there any more satisfying an occupation than that of the public servant who is trained with the skillsets that enable them to protect those most vulnerable in our communities in an emergency: the Police Officers, Ambulance Paramedics and Firefighters? These three occupations are the most commonly referred to and recognisable as our front line emergency responders, but there are others who do laudable and vital emergency response, but they don't feature so readily in our children's books, television and movie screens, and popular media. Of these three roles, parents and teachers (and peers) are least likely to talk about Firefighting as a career path for a woman, and it's 2016!

The 'pointy end' of emergency response is where the attention of the public is so often drawn. Our televisions, cinemas and newspapers are awash with stories and images of bravery in the line of duty and social media enables us to have a front row seat wherever we are. And if you're in the wrong place (sic) at the right time, you can film it, which will make you part of it.

What makes Trudeau's statement even more poignant is that the public still unconsciously apply gender-based

Image courtesy of WAFA

An urban female firefighter at work in her station.

stereotypes to these roles, which shape who they expect to see in these roles. Archaic attitudes adhering to perceived gender norms regarding firefighting can be dispelled just as easily as they were regarding politics. We start with a simple statement and follow on with actions that are universally fair, contemporary, respectful, and inclusive. This is essentially what WAFA works to promote.

Contemporary Fire Services empower communities with the knowledge and wherewithal to establish and maintain their own levels of resilience before, during, and after an emergency, so the role of firefighting agencies is equally as important right across the PPRR or 5R continuum. Agencies should consider the following questions when undertaking future resource planning.

Does building more ‘ready, resilient communities’ mean we are less likely to respond because we have increased the capability of the community to prepare?

Does being less reactive mean that we are more proactive, therefore spending even more time at the prevention end of the continuum?

What is our core business and who are the best people to do it?

Do we look like the communities we are protecting and empowering?

History plays a huge part in the culture of fire services, no matter what part of the globe. We love our milestones, our awards, our heroes and the romance that comes with such an iconised occupation as firefighting.

In an AFAC Statement on Workforce Diversity on International Women’s Day in 2016, member agencies acknowledged:

‘The unacceptably low levels of diversity, particularly in urban fire and rescue services, and approaching International Women’s Day on 8 March 2016, AFAC Council has identified changes required to increase attraction, recruitment, and inclusion levels across gender, racial, and cultural diversity.’

AFAC CEOs, Commissioners, Chief Officers and Fire Managers went on to say that they:

- Commit to diversity strategies that will not result in a lowering or compromising of performance or safety.
- Acknowledge that in order to build a more diverse workforce, strategies are needed to achieve a critical mass from varied backgrounds and genders.
- Acknowledge that without positive actions that are proactively implemented by industry leaders, there will be negligible progress.
- Agree to improve the internal cultures and behaviours within our organisations to be more supportive and inclusive of a more diverse group of people.
- Commit to understanding unconscious bias and addressing this within agencies.
- Commit to cooperatively developing and sharing best practice strategies to increase diversity.
- Task the Workforce Management Group with developing recommendations and commit to reviewing issues of diversity twice yearly when meeting as AFAC Council.

AFAC’s statement on ‘Workforce Diversity’ is by far the most supportive endorsement of the vision of Women and Firefighting Australasia by the national council and peak body for Australasian fire, land management and emergency services. It is further reinforced by the sentiments of the leadership of authority members, acknowledging that AFAC:

“Welcome that diversity is a key theme of the annual AFAC Conference for the second successive year in 2016, and that it is being held in partnership with ‘Women and Firefighting Australasia Inc.’.”

As for the Commissioners who pre-empted Trudeau’s earth shattering declaration of the ‘bleeding obvious,’ they’ve displayed resolve in what they consider to be the fairest and most equitable way forward for their organisations. They do this not just because it was expected and anticipated by those who heard it, but because they believe it’s good for the future and culture of the sector.

For more information, go to www.wafa.asn.au

WWW.PACIFICHELMETS.COM
SALES@PACIFICHELMETS.COM

The F15 Structural Fire Helmet. The advanced polymer chassis of the new F15 combines with the heritage of Pacific’s Kevlar® technology. Safety. Strength. Comfort.
Certified to AS/NZS 4067:2012, EN443:2008, NFPA 1971:2013

KINETIC

K-SAFE
DRAG RESCUE DEVICE

K-MOVE
SHOULDER SOLUTION

K-MOVE
ELBOW SOLUTION

K-SAFE
POCKET FLAPS

K-TREND
COLOUR DESIGN

K-TREND
ID

K-MOVE
PERFECT FIT

K-SAFE
New integrated safety and rescue components

K-MOVE
Ergonomic functional design combined with innovative materials

K-TREND
State of the art features in shape, colour and individual customer variations

K-TREND
COLOUR IMAGES

K-SAFE
POCKET SYSTEM

K-SAFE
HAND PROTECTION

K-MOVE
KNEE SOLUTION

Available in several outershells and moisture barriers.

VISIT US AT
WWW.LIONINTERNATIONAL.COM

LHD GROUP HONG KONG LTD.
Unit 1003-1004 . 10/F . Block 3
Tins' Center . No.3 Hung Cheung Road
Tuen Mun . N.T. . Hong Kong
P (+852) 2463 2982 . F (+852) 2463 2770
daniel.vonchamier@lhd-group.com

LHD GROUP AUSTRALIA P/L
Unit 3 . 15 Dunstan Road
Wingfield . South Australia
5013 Australia
P (+61) 8 8139 7777 . F (+61) 8 8139 7788
lhdaustralia@lhd-group.com

LION

FOR YOUR PROTECTION

PACIFIC F10 MKV STRUCTURAL HELMET
Certified to AS/NZS 4067:2012

PACIFIC FACE SHIELD & EYE PROTECTOR
Certified to AS/NZS 1337.1:2010

STANFIELD'S FH33 NOMEX FLASHHOOD
Certified to NFPA 1971:2013

PACIFIC F3D MKII STRUCTURAL HELMET
Certified to AS/NZS 4067:2012

NEW TO AUSTRALIA:
AS/NZS1716
P2CV TWIN VALVE
VERTICAL FOLD MASK
Additional valve provides further relief from heat and moisture build up inside the mask

ESKA SUPER MARS PLUS GLOVES
Certified to AS/NZS 2161.6:2014 Level 3

BRISTOL UNIFORMS CLOTHING (JACKETS & TROUSERS)
Certified to AS/NZS 4967:2009 Level 3

YOUR ONE STOP SHOP FOR
FIRE PPE
WWW.PACFIRE.COM.AU

YDS POSEIDON BOOTS
Certified to AS/NZS 4821:2014

PAC FIRE
AUSTRALIA

PHONE AU 1300 731 800
SALES@PACFIRE.COM.AU
WWW.PACFIRE.COM.AU

Protective clothing and equipment for Fire Fighters

In recent months there has been a growing interest in the area of protective clothing and equipment for Fire Fighters from stakeholders within the sector. This article will take a look at what's happening in the world of standards and an overview from Russell Shephard the chair of the joint Australian/New Zealand (A/NZ) Committee SF-049 Firefighters Personal Protective Clothing and Equipment.

Bronwyn Walker

Australia mirrors the work at the international level through the Standards Australia technical committee SF-049 – Firefighters personal protective equipment. Being an active member of this mirror committee allows Australia to have a 'voice' and provide input at the international level.

The international technical subcommittee (SC) of Technical Committee 94 SC 14 recently held their 16th meeting in Greenville, South Carolina, USA in the middle of July this year. Several resolutions were passed and future work plans were agreed upon in a number of areas including:

- Developing a New Work Item Proposal for Station Wear for Firefighters
- Developing a Wild land respirator protective devices (RPD) Standard
- Revising ISO DTR 21808 – Guidance on the selection, use, care and maintenance of personal protective equipment (PPE) designed to provide protection for firefighters.

The revision of this Standard will be focused on providing guidance for fire services when referencing the requirements of ISO 13506 "Protective clothing against heat and flame – Part 1: Test method for complete garments – Measurement of transferred energy using an instrumented manikin"

▼ The Australian committee maintains an active role influencing both domestic and global PPE standards.

Image courtesy of Standards Australia

Bronwyn Walker is a National Sector Manager at Standards Australia. In this role, Bronwyn is responsible for stakeholder engagement and standards development across Health and Community Services, Agriculture, Forestry, Fishing and Food and Education and Training. Bronwyn has come to Standards Australia from a decade in education, training and curriculum design and project management for the Community Services and Health Industry Skills Council.

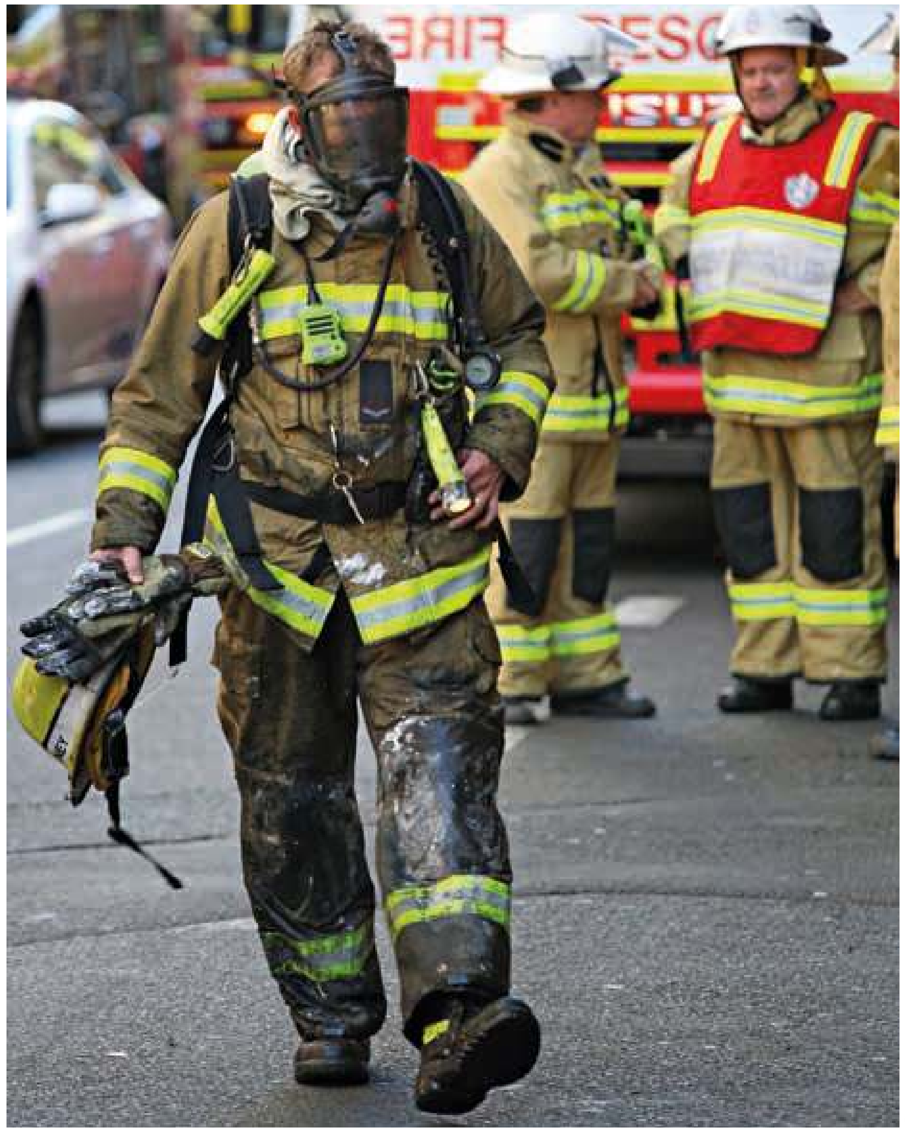


Image courtesy of Standards Australia

Advancements in international standards will affect station wear, wild land respirator protective devices and personal protective equipment.

The above subcommittee will hold their 17th Meeting in London on June 2017. One of the key working groups WG1 "General Requirements" is due to meet in October 2016 in St Galen, Switzerland to progress the important draft Standards currently out for ballot.

With the recent appointment of Russell Shephard as ISO/TC94 Chairperson in 2016 (ISO being International Standards Organisation) for a term of 6 years, there are already significant synergies between a number of the working groups and sub-committees. Russell is also currently the Chairman of ISO TC94 SC14 as well as the joint A/NZ Committee SF-049 Firefighters Personal Protective Clothing and Equipment.

Russell's current role is Manager of Standards for the Australasian Fire and Emergency Services Authority Council (AFAC). Prior to this, Russell worked for 34 years with Australian Capital Territory Fire Service and Emergency Services Agency, and also served in various positions with the United Firefighters Union. Russell also contributes as a Committee Member to eight other national and international committees and as a result of his international contribution, was awarded the inaugural W.R. Hebblewhite Medal in 2015.

"For many years there was limited participation from countries within this committee. Recently through a restructure of the committee, increased commitment from those involved and the appointment of new convenors to working groups has seen significant changes. These working groups have focused on key requirements for firefighter's PPE that is underpinned by a risk hazard approach. Also, an increase in publications across a range of fire related activities such as structural firefighting, wildland firefighting rescue and HAZMAT has also contributed to the committee's success" reported Russell.

More recently the committee has established a Joint Working Group (JWG) with ISO TC94 SC13 for Chemical, Biological, Radiological and Nuclear (CBRN), this JWG will consider what is required to address the issue of protection against CBRN and if indeed all aspects of protection can be achieved. The SC14 committee is also seeing great attendance from the participating countries as the development of these international standards provides a reference for countries without their own national standards for firefighters PPE.

Some of the main Australian/New Zealand Standards currently active for firefighting PPE are:

- AS/NZS 4821:2014 Rul 1:2015 – Protective footwear for firefighters – Requirements and test methods (EN 15090:2012, MOD) (Ruling 1 to AS/NZS 4821:2014)
- AS/NZS 4067:2012 Amd 1:2014 – Protective helmets for structural firefighting
- AS/NZS 4821:2014 – Protective footwear for firefighters – Requirements and test methods
- AS/NZS 2161.6:2014 – Occupational protective gloves – Protective gloves for structural firefighting – Laboratory test methods and performance requirements
- AS/NZS 4967-2009 – Protective clothing for firefighters – Requirements and test methods for protective clothing used for structural firefighting
- AS/NZS 4824-2006 – Protective clothing for firefighters – Requirements and test methods for protective clothing used for wildland firefighting (ISO 15384:2003, MOD)

We look forward to further developments, both domestically and internationally around this very important work.

For more information, email NSM@standards.org.au

MSA
The Safety Company
Your G1 Mask
A new Level of Comfort and Safety
The G1 Full Face Mask with its wide distortion free field of vision is not only lightweight and compact with overall low profile design, it brings best in class breathing comfort and is built to last.
For more information visit our website:
www.MSAsafety.com

PAB Akrapović

When conditions are at their worst,
we are at our best.

THINKING
AHEAD
firefighting series

PAB FIRE COMPACT
EN 443:2008, EN 14458:2004, MED Approved

Designed to protect the head under the most extreme conditions. Optimal relationship between protection and comfort with a broad spectrum of optional upgrades. Structural firefighting has never been safer. Now available worldwide!

PAB Akrapović | Most 26, HR-52420 Buzet, Croatia | info@pab.hr | www.pab.hr

SINCE 1953

A hands on approach

Like most items of PPC, a lot has changed over the years in the manufacturing of Structural Fire Fighting Gloves. With so many gloves on the market today, we are here to discuss what actually makes a fire glove and the features you should be looking for to assist you in finding a fire glove solution which best suits your operational requirements.

Joel Ward

After many years of supplying it's high end gloves through out the world and into Australia World leading glove manufacturer ESKA is proud to announce the opening of ESKA Australia. In a bid to offer further support to it's growing band of customers ESKA has appointed Joel and Mégan Ward as it's representatives for Australia/NZ. Be sure to check out the new range of structural, bushfire and rescue gloves being introduced into Australia by ESKA in the 3rd quarter of 2016.

Joel will be working in Australia and New Zealand to assist ESKA customers and to continue developing our product to ensure that ESKA can offer the greatest solutions for all of our clients.

A structural fire glove consists of three main components; the outer shell, internal lining and a waterproof membrane (moisture barrier) but all differ depending on the standard requirements and country of origin.

There are of course many other important factors to consider such as performance, construction, dexterity, cost, standards approvals, warranties and much more that we will touch on.

For many years the outer shell of the leather fire glove has been the norm but now with the advancements in materials there are many alternatives to assist the move away from the traditional leather fire glove. The question is do we really need to look at new outer materials offered or is leather still the answer as it will always offer excellent fire fighting capabilities especially for hand and foot protection.

With so many different variances of leather used such as cow hide, elk hide, split cow hide, grain elk hide, top grain hide and swine hide there are certainly a lot of alternatives out there.

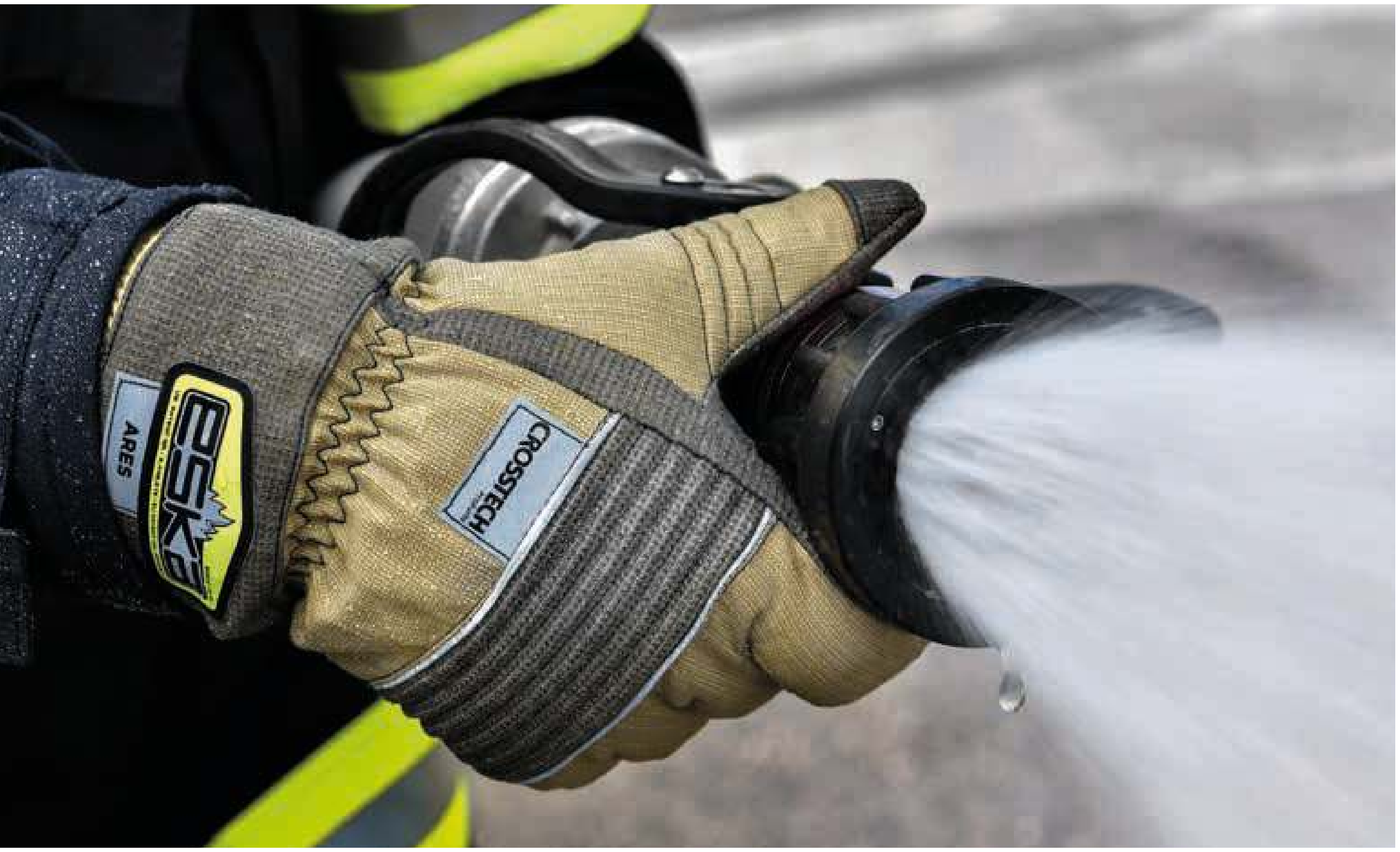
Also due to the vast amount of Kangaroo hide available in Australia, the last decade has seen Kangaroo leather become another alternative for the use in the outer material for structural fire fighting gloves.

All the leathers mentioned above have advantages and disadvantages but one thing they all have in common is that leather is becoming old technology and as humans we are always looking at pushing the boundaries for new advancements and to create better alternatives.

Leather gloves by nature, and to comply to varies standards do feel bulky. The new direction of blended fibre gloves (non leather) do not have the same bulk as current leather gloves. Non leather gloves also offer greater wicking properties to ensure there is not a build up of moisture

▼ Glove models in the EN segment on the A+A show in Germany.

Image courtesy of ESKA



Images courtesy of ESKA

▲ **Extreme conditions require extraordinary protection. ARES is the first Australian non-leather glove and consists of several new highly technical FR materials fully developed by ESKA.**

in the outer material as leather is quite absorbant which then add's weight making it feel quite heavy. Also when wet leather is weakened against abrasion and cut resistance where material keeps the same properties whether it is wet or dry.

With these advancements over the last decade, the development of new materials and blends there is a lot more choice than in the past for the manufacturing companies and then the consumer. Other well known fibers such as Kermel®, PBI® etc. are now being blended with other materials such as woven Nomex®, Aramid/Viscose FR.

Due to the palm of the glove being subjected to more risk of abrasion and general wear and tear even more higher end materials are being blended such as FR silicon coated to Kevlar® fabrics or even blending Kevlar® with steel fibreglass and Silver threads to achieve greater overall protection and strength. All of these blends and variations may all sound confusing to the consumer but the main objective from the manufacturer is to offer as lighter weight as possible outer which also offers a high level of protection due to the extreme conditions it will be subjected to over the products life.

Now that we have discussed the outer fabric it is time to look at what makes up the internal workings of a structural fire glove and what you should be looking for. Many manufacturers keep this information in house as there is quite a science in trying to keep the heat from transferring through the glove as well as maintaining dexterity. Again just like the advancements with outer materials the same advancements have been

▼ **Protecting your hands is a matter of course for us, protecting your gloves is our mission.**

ECO-DRYSHIELD
A HAINSWORTH TECHNOLOGY

ECO–DRY Shield has been developed specifically with the requirements of wildland firefighters in mind.

This necessitates that the garment be comfortable to wear during high activity levels, during which the user is exposed to extreme radiant and convective heat. A lightweight single layer construction combines the comfort of Australian Wool and Lenzing FR, with the thermal performance of DuPont™ Nomex® to allow mobility and flexibility as required during prolonged call–outs whilst at the same time providing maximum thermal protection.

Design That Saves.

HAINSWORTH®
TECHNOLOGY

+44 (0)113 257 0391
protectsyou@hainsworth.co.uk
www.protectsyou.co.uk

/protectsyou @protectsyou

WE WON'T LET ANYONE ELSE GET THEIR HANDS ON YOUR PPE

Because you need your PPE to give maximum protection day-in, day-out, our Managed Services is essential for confident, effective firefighting.

Bristol will collect, decontaminate, clean, inspect, repair and deliver your PPE using our own skilled technicians and facilities. We can also look after your helmets, gloves and boots too!

With world-class design, specification and manufacture of an extensive range of PPE, Bristol is the first choice of firefighters in over 110 countries.

To find out more about our products and support services, call us on +44 (0)117 956 3101, email us at enquiries@bristoluniforms.com or visit our web site, www.bristoluniforms.com

BRISTOL

Bristol Uniforms Limited, Wathen Street, Staple Hill, Bristol BS16 5LL, United Kingdom
Tel: +44 (0)117 956 3101 Fax: +44 (0)117 956 5927
email: enquiries@bristoluniforms.com
www.bristoluniforms.com

Images courtesy of ESKA

▶ **WARRIOR is a tactical glove made of a new developed Fire Block leather.**

▲ **SUPERMARS PLUS has a fire resistant impact protection shell which prevents injuries.**

developed with the internal thermal lining of a Structural Fire Fighting glove. New internal liners such as Kevlar®/Silver blends are offering many things such as thermal and cut protection, antibacterial, odor – inhibiting, anti – static and thermo dynamics to again assist the fire fighter in their day to day duties. Kevlar® is commonly used as it is an Aramid fibre with a low specific weight that offer's high tensile strength, excellent heat resistance, dimensional stability, and low elongation to break plus it is also chemical resistant and has outstanding abrasion resistance.

The feel of greater dexterity does not just boil down to the thickness of the glove as design also plays a large part plus like most things it is all about wearer perception. One major factor that assists greatly with dexterity is the cut of the glove. Ten years ago the majority of structural fire fighting gloves we're 2 dimensional but now again with the advancements in technology, manufacturing capabilities etc. you will find that the majority are 3 dimensional. A 3 dimensional design enables the manufacturer to design a glove that is ergonomically designed for higher wearer comfort and tactility from a ergonomic cut glove based on the natural hand position. One other thing when selecting your structural fire fighting glove is ensuring that the lining is fitted correctly to ensure that it can not be easily removed from the glove when donning and doffing and the liner is retained in the glove after washing. Again usually selecting a high end glove with warranties will ensure less risk that the internals of the glove are fitted correctly and will stay in place for a long period of time.

A moisture barrier is also an essential component to the construction of a Structural Fire Fighting glove. Adding a moisture barrier can be a challenging task for some manufacturer's as it needs to be fitted correctly between the internal and external layers. People may think that all moisture barriers offered are generally the same but this is not true as there is a large amount of technology that goes into creating a moisture barrier. When looking at the correct moisture barrier protection do your homework as glove moisture management plays a large role in protecting the fire fighter especially from moisture build up that can cause steam burns. Most moisture barriers are not there just to stop moisture entering the glove but also to offer breathability and assist with extracting moisture away from the skin due to such things as a build up of sweat. However extracting moisture away from any PPC that consists of a moisture barrier is extremely difficult at the best of times. Also when selecting a structural fire fighting glove look at what type of moisture barrier is offered as there are generally two types of moisture barriers with one just offering moisture protection and other's offering permanent protection against blood, viruses, and body fluids fire fighting gloves. Again look at the amount of protection offered and how it is offered depends on the quality of the moisture barrier provided as they do vary. It is important to select the right moisture barrier which will offer the right level of protection for the task at hand but like anything it is best to have more protection then not enough which is why I always advise that you source a glove with full protection against blood bourne pathogen, body fluids etc.

In summarising as discussed above there are a number of alternatives for you the consumer to consider when purchasing a Structural Fire Fighting Glove. It can be quite confusing and daunting for most, if you keep in mind these three most important factors dexterity, correct and up to date Standards Certification relevant to your country and Manufacturer Warranties you should be well on your way selecting the right fire glove for your requirements.

For more information, go to www.eskaaus.com.au

eska AUSTRALIA

PO BOX 182 Upper Coomera
Queensland Australia 4209
T 1300 717 117 | E sales@eskaaus.com.au
www.eskaaus.com.au

KNOW YOUR INDUSTRY
BECOME AN
FPA AUSTRALIA
MEMBER TODAY!

Fire Protection Association Australia offers a flexible range of membership options to suit all stakeholders working in or associated with the fire protection industry in Australia.

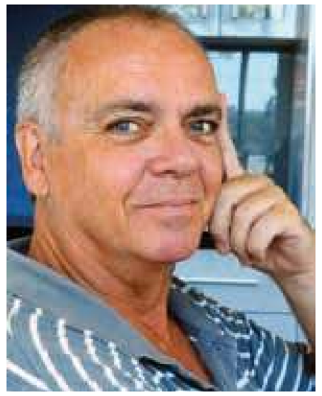
Stay connected to your industry with the latest:
- News
- Events
- Technical information
- Resources

FPA AUSTRALIA

BECOME A MEMBER TODAY Call 1300 731 922
Email member@fpaa.com.au Visit www.fpaa.com.au

Firefighting and breathing protection then and now

Personal protection for firefighters has a long history. While many other technological developments sound as if they evolved out of a fairy-tale past, our modern firefighting equipment seems more as though it were plucked straight out of Science-Fiction.



Torbjorn Lundmark

Torbjorn Lundmark is a freelance writer in the field of occupational health and safety.

Even the ancient Egyptians had firefighters. But the pyramids were built of stone, you might say, tongue-in-cheek. So why the need for firefighters? Naturally, because the cluttered cities and villages, albeit often built of mudbricks, were also full of flammable materials: reed floor mats were *de rigueur*, and walls were commonly covered with dyed linen sheets. Shade-cloths and awnings would have been needed to provide shelter from the sizzling Egyptian sun. And even in this largely tree-less land, the furniture was made of wood. Marketplaces and souks would have been as covered by canvas as they are today. Textile merchants and weavers of flax and wool must have been common, keeping bolt upon bolt of flammable material in their stores. All cooking and heating and lighting were, of course, done with open flame, and when the inevitable accident happened, the houses were clustered close enough together for the fire to spread rapidly through the neighbourhood.

Solution: the Pharaoh's firefighters and water from the Nile.

The first brigades

Move in time and place to the Roman Empire. After several spectacularly disastrous fires, in the year 6 AD the Emperor Augustus decided that the sort of fire brigade used up until now, comprising slaves, wasn't enough: now he put together a massive fire-response force of 7,000 so-called *vigiles* who worked as professional firefighters in their own designated sections of Rome.

The techniques were basic. Augustus's early fire brigade used a method that could only be described as long lines of men 'passing the bucket'. Others used heavy equipment to raze neighbouring buildings to the ground to stop the fire from going further.

Even today, some modern firefighting units call themselves *vigiles* brigades in the 2,000-year tradition.

Nevertheless, Rome wasn't built in a day, and was in fact re-built many times due to disastrous fires. Emperor Nero himself, who supposedly played his fiddle while Rome burnt in AD 64, was the first to recommend that Romans make their houses more fire-proof, build them further away from each other, and live closer to available water supplies. Nero could thus be said to have instigated town planning with fire safety in mind.

▼ The Great Fire of London.

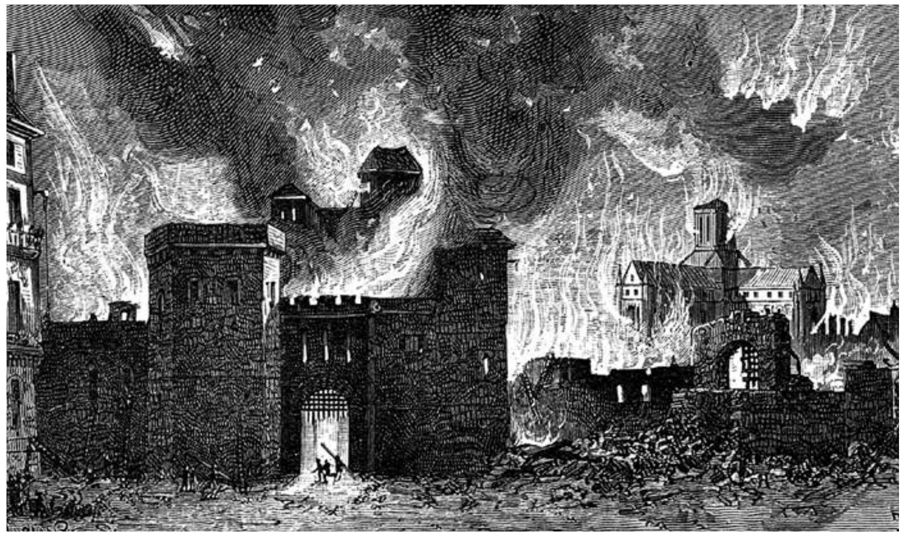


Image courtesy of iStock.com/duncan1890

Not so ancient

But effective firefighting equipment and protective gear for personnel were still a long way away. Even at the time of the Great Fire of London in September 1666, that most essential of tools, the fire hose, hadn't even been invented. The fire started – perhaps ironically – in a bakery in Pudding Lane, raged on from Sunday to Thursday, destroyed 87 churches and 13,000 houses over a 5 km^2 area, and rendered tens of thousands of Londoners homeless. Here, as in ancient Rome, the fire could only be stopped by destroying wide swathes of buildings in its way.

It is interesting to note that not only firefighting methods were adopted from Rome at this time, but commercial firefighting interests as well: in ancient Rome's pre-Augustus days, private firefighters stood outside the burning house and bargained with the owner about advance-payment for extinguishing the blaze (too much haggling and the property burnt to the ground), while in England the firefighters were paid by insurance companies, and would only start their work when they had established that the building was insured by their particular underwriter.

What about the people on the job?

Over the next couple of hundred years, new types of firefighting equipment, machinery and vehicles were invented – but not much in the way of protective gear for the personnel. Water-pump technology became more sophisticated (this is why the word 'fireman' is *pompier*, *pompiere*, and *bombero* in French, Italian and Spanish respectively, all meaning 'pumper'). Powerful pump vehicles may have revolutionised firefighting, but for a long time they were still horse-drawn.

It took much longer before fire authorities began to pay attention to the protection of the people who did the firefighting. Even helmets didn't enter the scene until around the mid-1700s. Protective clothing made its debut much later, let alone respiratory protection.

It was important for the firefighter to get *into* the building. Just pumping water at it from the outside was only part of the solution. Leather clothing could perhaps withstand the heat and flame for a little while – but smoke was the biggest problem.

It has been said that, in desperation, some early firemen might have grown their beards in order to soak them in water and stuff the wet hair into their mouths during their smoky passes. The Italian scientist and inventor Giovanni Aldini had an idea. In 1825, he came up with the *Apparatus Aldini*, a sort of asbestos hood lined on the outside by a metal mesh. Many regard this as the seed of respiratory protection for firefighters.

From there, the step was short to an array of new inventions that strove to supply air to the firefighter, first through a hand-pump connected with an air hose to a fireman's helmet, and then to various sorts of head and upper-body coverings. Filter respirators using various useful (and useless) filtering media also appeared.

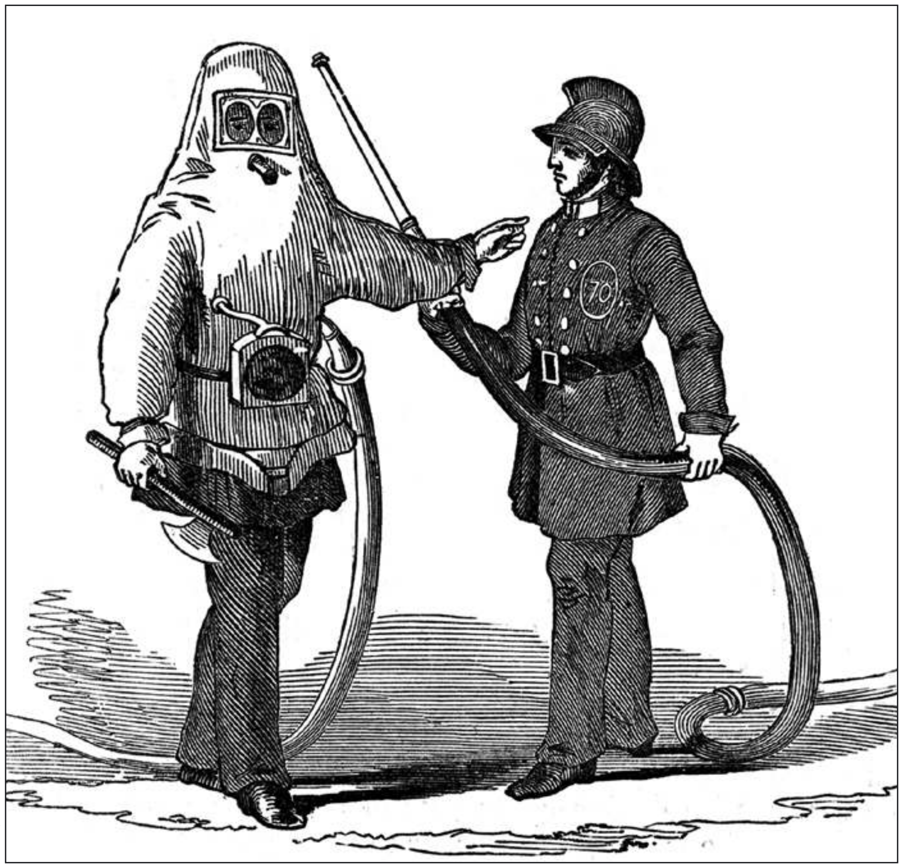


Image courtesy of iStock.com/duncan1890

▲ Primitive breathing gear.

…but we need self-containment!

All through the first half of the 1800s, new respiratory protection devices came and went, many using hoses to channel air from a remote air pump to the firefighter. This permanent hook-up was cumbersome, hindering and ungainly. It wasn't until 1863 that the first contraption was patented that could vaguely claim to be 'self-contained'. The firefighter had an air container strapped to the waist, made of a rubber balloon covered inside and out by canvas lining. It could be inflated by a pair of bellows. Two hoses ran to a mouthpiece between the fireman's teeth. Sealing corks were pulled out to release the air when it was needed.

Invention and technology took off. In the next decades, many new apparatuses appeared – even a re-breather model that was launched shortly after the turn of the century.

For better or for worse, war is often a great technological catalyst, and two world wars served as a springboard for more and more sophisticated self-contained breathing protection, where high-tech respirators initially designed for Air Force pilots soon spread to the Fire Brigades.

It is from the significant developments during the early half of the 20th century that we still have several of the names of renowned SCBA designers and manufacturers today.

◀ Leading-edge encapsulated protective suit.

Image courtesy of Ansell/Trelichem

▶ Modern firefighter's harness and face mask.

Image courtesy of Interspiro

Hurtling towards the future

Today's firefighting protective devices and apparel bear little resemblance to their rudimentary forerunners. New materials have been discovered, manufactured and put to use: think Nomex, think Kevlar, think carbon fibre. Harnesses are ergonomically designed, light-weight, perfectly balanced, with non-textile straps, fire-resistant materials and cutting-edge design.

Even basic things have been taken into consideration, such as reflective strips, 360° location beacons and large rescue handles, should the person need to be dragged away to safety.

Modern BA face masks may feature heads-up displays (HUD), as well as crystal-clear voice communication.

Regulators may have both digital and analogue displays, and are constructed to show the same information unaffected by ambient heat. The BA set is probably fitted with a personal alert safety system (PASS).

In addition, BA sets are often used together with advanced protective suits made of various high-tech materials and material combinations, providing whole-body protection not only from heat and direct flame, but also from exposure to chemical, biological, radiological and nuclear (CBRN) substances.

Also on the rise are integrated global positioning systems (GPS), thermal imaging and other sophisticated tools for the firefighter.

All this is a far cry from Emperor Augustus's *vigiles*, with their water buckets and their axes and battering rams and wall-pulling hooks, but without any means to protect themselves from their work environment. Modern firefighters still work with the same purpose as their predecessors from 2,000 years ago, albeit with much better training and personal protection through vastly more sophisticated technology.

For more information, go to www.sea.com.au

MCH-6/EM
DRIVEN BY:
SINGLE-PHASE ELECTRIC MOTOR
CHARGING RATE:
100 L/min 6 m³/h
DIMENSIONS:
HEIGHT 35 cm
WIDTH 65 cm
DEPTH 39 cm
DRY WEIGHT: 39,5 Kg

MCH 16 ET COMPACT
DRIVEN BY:
THREE-PHASE ELECTRIC MOTOR
CHARGING RATE:
315 L/min 19 m³/h
DIMENSIONS:
HEIGHT 88 cm
WIDTH 92 cm
DEPTH 61 cm
DRY WEIGHT: 187 Kg

MCH 16 ET STANDARD
DRIVEN BY:
THREE-PHASE ELECTRIC MOTOR
CHARGING RATE:
315 L/min 19 m³/h
DIMENSIONS:
HEIGHT 63 cm
WIDTH 83 cm
DEPTH 43 cm
DRY WEIGHT: 100 Kg / 220.4 lbs

COLTRI ASIA PACIFIC
MADE IN ITALY

COLTRI ASIA PACIFIC Co., Ltd.
Free Zone at 304 Industrial Park 2 No. 94/5, Moo. 3, T. Khao Hin Sorn,
A .Phanomsarakarm, Chachoengsao 24120 Thailand
Tel: + 6638855103 to 5 Fax: + 6638855106
www.aerotecnicacoltriasiapacific.com

AEROTECNICA COLTRI® S.p.A.
via dei Colli Storici i 177 5010 San Martino della Battaglia Brescia - ITALY
Tel: +39.030.99.103.01 +39.030.99.102.97 Fax: +39.030.99.10.283
www.aerotecnicacoltri.it

› **Mini Verticus III Series**
The most advanced compact unit system in Fire Stations and Vehicles. The system can deliever air up to 250l/min and can be upgraded to fully automatic with refrigeration dryer Air-Kool system, extrenal filling panel as well as stroage cylinders can be easily fitted.

› **Containment Fill Statoins - Stationary & Mobile**
BAUER offers only independently tested Containment Fill Stations which were found to protect from overpressure and fragmentation per NFPA 1901.

› **BAUER Pure Air**
As the market and technology leader in Breathing Air production, BAUER has instituted a Quality Seal as part of our worldwide campaign of information and quality certification in accordance with DIN EN 12021, which is in cooperation with TÜV.

› **BAUER COMPRESSORS ASIA PTE LTD**
25 Pandan Crescent, #01-10 Tic Tech Center
Singapore 128477
Tel: +(65).6271.6271
Fax: +(65).6272.3345
Email: info@bauer-asia.com
www.bauergroup.com

The convergence of video and fire safety

Using video for fire safety outreach is nothing new, many people and departments are doing it – just search YouTube using the words “fire safety” and you’ll get 1.1 million results. However, this raises the question – how effective are they and how do you measure this effectiveness? Is the number of views a good indicator? Are these videos as good as they can be?

Ed Comeau

Ed Comeau is a technical writer focusing on fire safety and digital communications through his company, writer-tech.com. He is a former chief fire investigator for the National Fire Protection Association and was a fire protection engineer for the Phoenix Fire Department’s Special Operations and Training Division where he helped develop training programs in hazardous materials, technical rescue and recruit training. He was a fire fighter with the Amherst Fire Department while receiving his degree in Civil Engineering from the University of Massachusetts-Amherst. He can be reached at ecomeau@writer-tech.com.

I’ve been involved with helping to produce videos in various roles over the years, and it has become easier than ever with the explosive growth of smartphones, but this could also be creating a bigger problem – 1.1 million fire safety videos.

So, you want to make a video, or maybe you want to make your videos better, how do you go about it? There are some pretty simple things you can do.

Camera

The resolution on today’s smartphones is remarkable and they may very easily be all you need. The other possibility is a digital single-lens reflex camera, or DSLR. These are the traditional still photography cameras that have been around for years, but they are now building them with video capabilities as well.

Probably the biggest differentiator between them is the capabilities when it comes to focus, depth of field, lens types, white balance and all of those other buzzwords associated with video production. There are apps that help emulate these on a smartphone, and you can get clip-on lenses for telephoto or wide angle to help enhance the smartphone’s capabilities. A DSLR has these features built in, and while it is possible to use the camera on full auto mode and get right to shooting, I would really encourage you to learn how to use all of these features in manual mode.

▼ A shotgun microphone, whether it is on a boom pole or on top of the camera, will help improve your sound. Feeding it into an external recorder, such as a Zoom H1n or H4n will make it even better.

Image courtesy of Ed Comeau

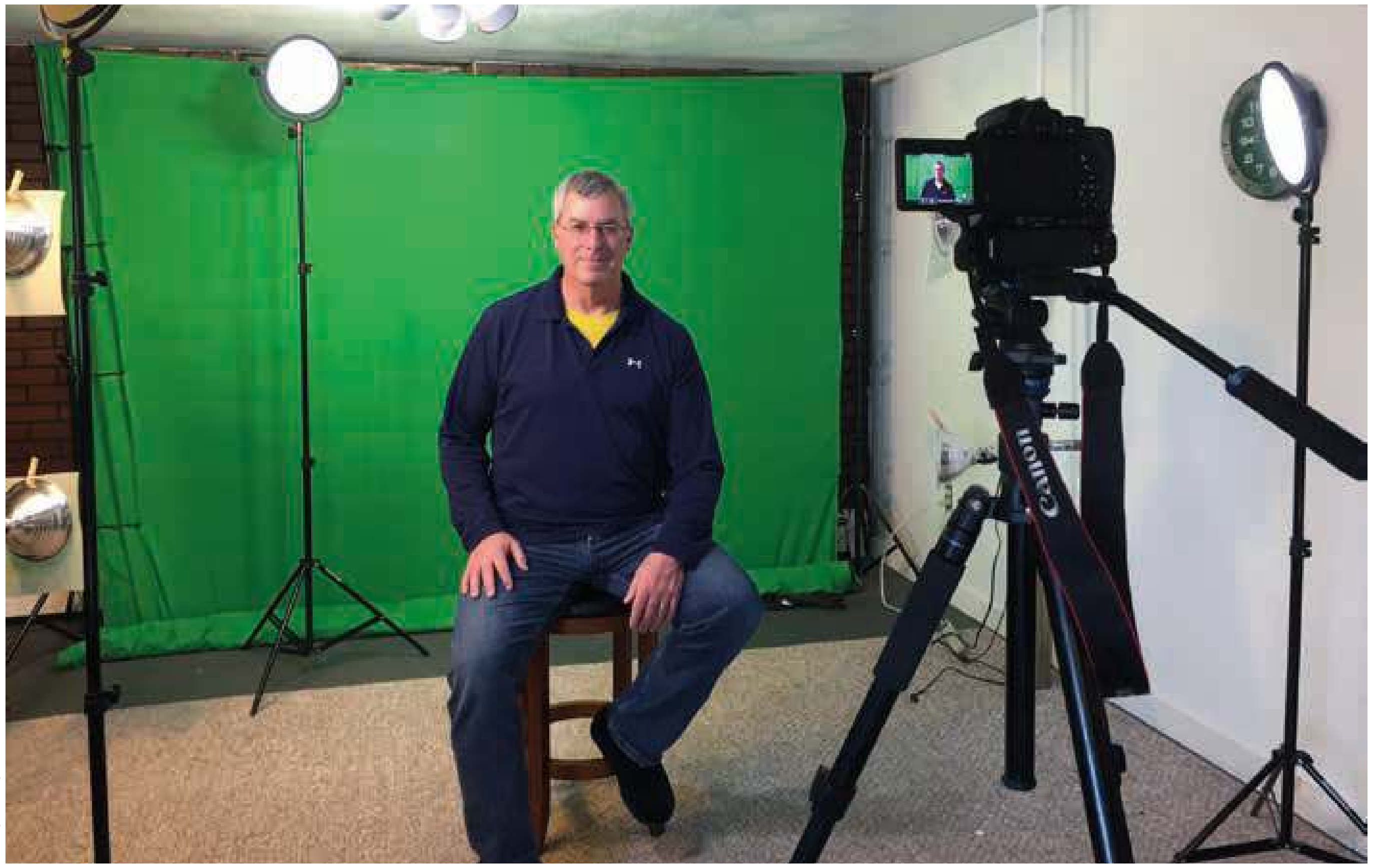


Image courtesy of Ed Comeau

▲ In a studio setup, having a set of three lights gives you a lot of flexibility and improves the look of your production significantly.

Sound

Some say that any video is 50% visual and 50% sound, but I would say that it is more like 25% visual and 75% sound. Think of any clip you have watched with poor video but good sound, the mind is good at filling in the blanks for poor video. But, if it has poor audio, most people will just click out of it and move on.

Sound is REALLY important, and no matter which smartphone or DSLR you choose, it is going to be terrible at capturing sound, there are no two ways about it. They are just not designed to do it.

There are a few workarounds. The first is you can have an external microphone that feeds into the camera, such as a lavaliere or shotgun microphone. In both cases, however, you don’t have much control over the signal coming in and, depending on your setup, you might not be able to monitor the sound through headphones (and always use headphones, not ear buds!). A microphone going into an external recorder is an ideal situation, this gives you a lot more control over the sound, as well as the capability to monitor it.

Lights

Remember, if people can’t see what you are recording, it is then called “radio,” and that is why lights are important. There are two categories of lights we’re looking at here, artificial and natural (also known as The Sun). You don’t have as much control over natural light, but you can do things such as move your subject, move yourself, use reflectors or block the sun. Certainly, if you are on an incident, you have no choice and will have to make the best of the situation.

Artificial lights can be lights in the apparatus bay, clamp lights that you get at a home improvement store, floodlights or specialized lights for video production.

Techniques

No matter what camera you are using, you can make your video so much better by using some of these standard, tried-and-tested techniques. Remember, the goal is to get people to want to watch your videos, and shaky, poorly composed video that zooms in and out is just going to look amateurish and not engage the viewer.

Hold Your Camera Horizontally.

This is probably the most basic rule, and one that is most universally violated (and I am raising my hand, guilty as charged). Why?

First, think about your eyes…are they placed next to one another or above each other? Second, when you take a video with your camera held vertically, and you play it back, you now have a very narrow video with black bars on each side on your television or computer. You see a lot above and below your subject when there was probably a lot more happening to the left and right, and you are going to have to pan more to capture it.

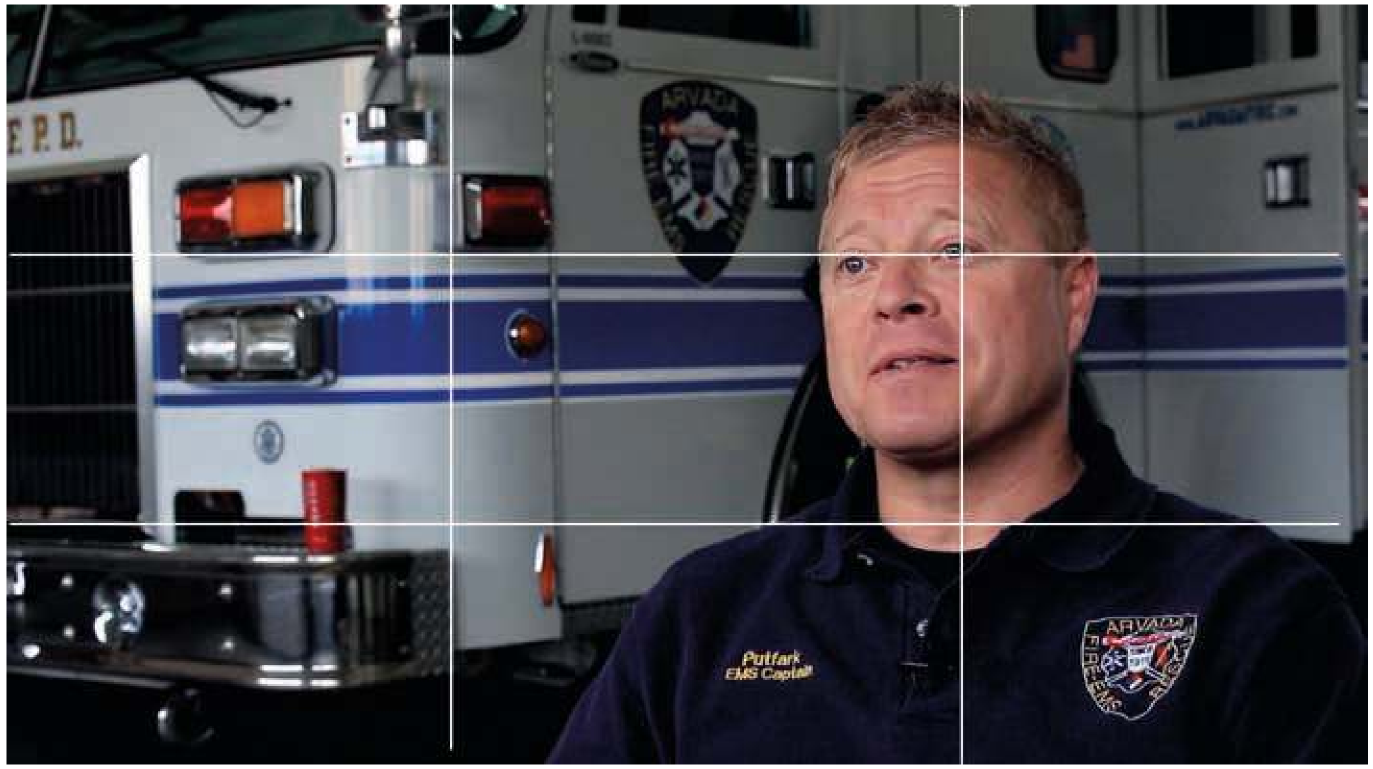
Rule of Thirds

The Rule of Thirds is key to helping you compose your shot. Imagine dividing your screen into nine rectangles, or a tic-tac-toe board. Where the four lines intersect are points where you want to position your subject, whether it is an interview or a fire scene, to create a more dynamic image.

It’s also important to have your subject looking into what is called the “lead space,” or in other words, into the longer portion of the frame. Why? Just trying doing it the other way, and you’ll see why in a second.

Stabilize your video

You want to try and keep your footage as stable as possible. Shaky, unstable video will cause the viewer to click away. If you are handheld, brace your elbows against



Images courtesy of Ed Comeau

▲ Your viewfinder probably has a feature where it will divide it into nine rectangles. You should position your subject, or the action, on one of these four intersection points.

◀ Stabilizing your shot is key to making your production look more professional. A tripod is best, but even using the hood of a car can be a good fix in the field.

your body, not out at arms length where your arms are quickly going to get tired. Rest the camera, your elbows, or your body on something, such as a wall or the hood of a car.

A tripod is a vital piece of equipment. A DSLR has a screw mount on its base to attach to a tripod, but you will have to get an adapter for your smartphone, and these are easily found online and are an invaluable investment. You can start out with an inexpensive tripod and move up because you will find a hundred uses for an old tripod, trust me.

Zoom and movement

Zooming in and out, panning the camera left, right, up and down – avoid it because this is something that will drive your viewers crazy and it often doesn't add much to the video. If you do have to zoom in, it is often better to "zoom with your feet" or, in other words, move closer to the action, especially with a smartphone. The digital zooms on smartphones sacrifice image quality to get that closer look.

Getting Seen

I use YouTube as my video library. Once I upload videos, I then have the ability to send them as a link in an email, embed them on a website or share them on Twitter. You never, ever, want to send a video file as an email attachment because they are so large it eats into bandwidth, and think of the poor person trying to download it on their mobile.

Another advantage to hosting on YouTube is analytics. You get incredibly useful information on how many people are watching your video and, more importantly, how long they are watching it. If people are dropping out 15 seconds into your 2-minute video, then it's time to look at how it was laid out and fix it for the next time.

All of the social media platforms are making video more seamless than ever before, and if you are shooting on a mobile, you can edit and upload directly into a tweet or a Facebook post. While you can link to a YouTube video from within Facebook, it's not quite as seamless; they want you to upload your videos from within Facebook. Facebook's analytics aren't quite as robust as YouTube, but you still get what are called "Insights" on video traffic, and you can't argue with the visibility that your video will get on a platform like Facebook.

I have learned most of what I know from others on YouTube, and I have been posting a series of short tutorial videos on my YouTube channel (www.tinyurl.com/writerdashtech) that may be helpful. I also have links on there to these other channels where I have learned a ton of information.

I love hearing from people that are doing video work, so feel to drop me a note at ecomeau@writer-tech.com and let's talk about what you're doing.

As with anything, the best way to learn is by doing, so write, shoot, edit – then repeat!

For more information, go to www.writer-tech.com

SEE THE CLARITY.

X FACTOR
THERMAL IMAGERS

UPGRADE
Upgrade your Bullard TI at an affordable price

TRADE-IN
Get credit for trading in Bullard and other TIs

5-YEAR WARRANTY
5-year full TI warranty

Bullard®

Learn more at www.bullard.com/xfactor

The wisdom of a crowd: warnings of the future

Our approach to warning communities of an emergency has transformed rapidly over the last decade. A little bit further back, say 15 years ago, we were only just beginning to consider how we might use the internet to share public information about emergencies. Traditional broadcast media channels were our primary modes of public communication and even then, the focus was much less about warnings and much more about how many trucks we had on scene.

Deb Symons

Deb Symons is a Partner with Cube Group. Deb has worked in the emergency management and public safety sector for more than 15 years leading local, state and national initiatives. She has particular interests in multi-agency collaboration and team dynamics, volunteerism, warnings and risk communication, community engagement, and achieving public value outcomes.

Internet ready mobile devices were still a thing of the future, and sharing of images or maps rarely occurred due to the time and effort required to produce these, and the capacity of our dial-up modems to receive them. Google was but a babe, and online mapping services were still many years away. Facebook, Twitter and their many sharing platform peers were still a dream. For many communities, the local fire brigade's siren was the only real 'warning system' and a text message would have arrived on a piece of paper.

▼ Traditional channels of communication during an emergency remain important, but we are learning more about how to connect with people using digital and social media channels.

Image courtesy of cubegroup.com.au

Since then, not just technology but our thinking and policy on the responsibility of emergency services to more effectively warn communities has matured significantly.

In 2016 the management and provision of public information, as it is now known, is an essential priority activity across all Australian emergency services. Officially recognised in the Australasian Inter-Service Incident Management System (AIIMS), many organisations now list warning communities as the first priority of an incident manager.

Public information practice has advanced to understand the importance of targeted and timely messages, delivered across multiple channels, and including specific information and advice to help people take safe action. A range of related research has explored issues such as risk perception, warning fatigue, decision-making and motivation to act. All of this is thoroughly interesting, but let's look at some of the next frontier ideas.

Images courtesy of cubegroup.com.au

▲ As bushfires continue to increase in their frequency and severity, the provision of effective warnings has become a critical capability for emergency services.

Let it go: Embrace the crowd

One of the more challenging aspects of contemporary public information is the growing capability and trend for community members to not only receive warnings, but to share and discuss warnings, or even write their own warnings. Sacré bleu!

Traditionalists panic as this is far from a standard command and control scenario. 'But they could be wrong! But they've left out the important detail we had provided!' 'But their warning will fall out of date!' Yes, yes and yes. Look at the positives though. People are actively engaging in connecting with their community and building disaster resilience, they are taking on a shared responsibility for safety, and they are potentially reaching and influencing people who are not connected to (or listening to) official channels.

In a report released by the Rockefeller Foundation this year on public health communication, Dr. Barbara Reynolds, senior advisor for crisis and risk communication at the (US based) Centers for Disease Control and Prevention summed up an effective warning thus: "The right message at the right time from the right person can save lives. When we don't have these three things together, people die."

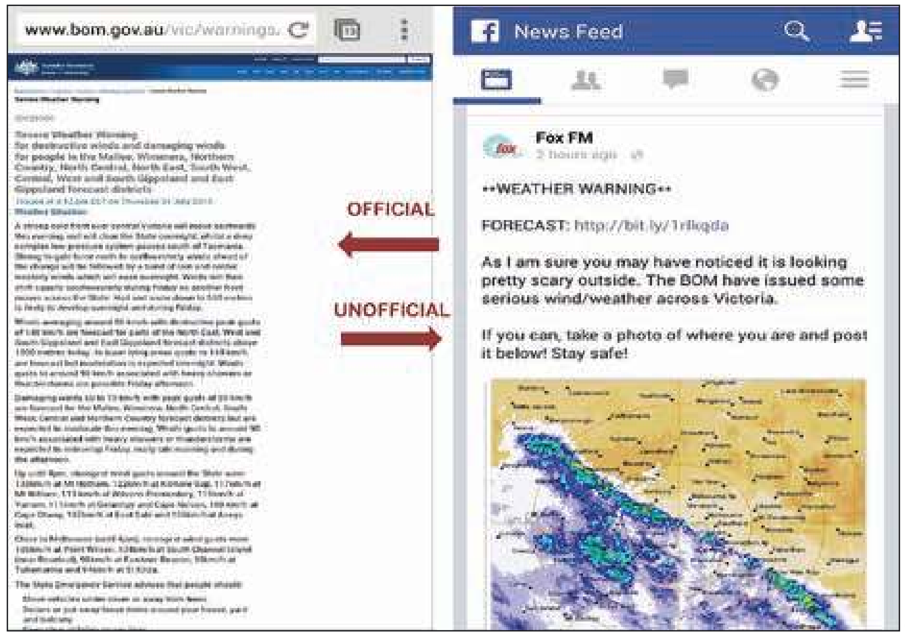
We are advancing well when it comes to building the right message and issuing timely warnings (although there is always more to be done). It is the 'from the right person' element that we need to think more deeply about. Research reveals that an authoritative or official source is not necessarily the 'right' person to inspire action. At least not on its own. Professor Douglas Paton of the University of Tasmania has argued for example, that trust in the source of information has greater importance and impact on people deciding to take action, than the content of the warning itself.

▼ The 2014 National Review of Warnings and Information included key recommendations on improving the use of social media and providing more spatial and visual content.

NATIONAL REVIEW OF WARNINGS AND INFORMATION

Final Report
November 2014

An Australian Government Initiative



Fox FM

••WEATHER WARNING••

FORECAST: http://bit.ly/1rlkqda

As I am sure you may have noticed it is looking pretty scary outside. The BOM have issued some serious wind/weather across Victoria.

If you can, take a photo of where you are and post it below! Stay safe!

Image courtesy of cubegroup.com.au

▲ Figure 1: At left an official severe weather warning is provided. At right, a local radio station has tailored its own weather warning on Facebook, drawing from and linking to the same official sources, but with less detail and a more informal tone.

Post-incident analysis across a range of hazards has revealed that householders are influenced by how their neighbours are responding. Analysis of social media activity in an emergency highlights that messages shared or authored by individual citizens and media organisations often capture more attention than official emergency services messages. In this context then, a parent, a local community leader, a media personality or a friend may be the 'right' person. Frustrating as this may be to some, we need to acknowledge the power of the crowd as a strength and to better capitalise upon this strength.

Tapping into influencers

In an emergency we can count on a surge of social media activity. A number of researchers have studied these surges, painstakingly categorising the nature of the activity and tracing the source and use of information as it is shared rapidly across networks. One of the interesting concepts arising from this research is that of 'influencers'. Influencers feel motivated to get involved in sharing information about an emergency for a range of reasons and can quickly emerge as integral sharing points across an extensive network.

Importantly, they don't necessarily create original content but tend to repackage and share existing content. What do they share? Why do they repackage? We have more to learn but therein lies the opportunity. How might emergency services create content that is easily and well shared? Figure 1 provides an example of an official warning repackaged (in this case by a media outlet) on their Facebook page. It highlights the transformation of a detailed warning to a short, more informal and more visual message.

Withholding the (spatial) detail

"They must know where the actual fire is. Why don't they show us a map with more than a 'pin point' on it?" (Participant in 2014 National Review of Warnings and Information research by Ipsos)

Yes, they are onto us, and community expectations continue to rise. Sharing of spatial information with the public during emergencies is still rudimentary, and yet there is increasing access to sophisticated spatial information and modelling to inform response strategies. Why don't we share it? Reasoning ranges from 'it is too complex' to 'the modelling doesn't provide certainty'.

In 2002 a similar debate raged in Victoria about whether to share incident information with the public. Opponents argued that the information might be incomplete or incorrect, and that it may confuse people. Advocates argued that information, with the right consideration for format and context, would empower communities to make better decisions. The advocates on this occasion, won the debate. Is the argument so different in 2016 when it comes to sharing spatial information?

By 2020, emergency warnings will almost certainly be underpinned by spatial information, mapping and visual cues for communities. The question is whether emergency services champion this work or whether others take the lead in lieu of them.

A two-way street

The 2014 National Review of Warnings and Information acknowledged the challenge that many emergency service organisations face in resourcing social media channels and responding to questions and discussions during an emergency, with some being completely overwhelmed during large events. Indeed, a small number of organisations remain reluctant to use social media for this specific reason. The need to engage in two-way information exchange is real. As the Victorian Country Fire Authority's Martin Anderson has said, "Using social media as an outbound only channel is the equivalent of phoning someone to tell them an important piece of information and then hanging up as soon as they asked a question".

The need to innovate and once again, to trust in the crowd, is paramount. The use of trained social media monitors, a network of volunteers or virtual operations support teams (VOST) to assist in living within, filtering and fielding online conversations continues to grow. There are challenges around training, authority, managing mis-information, and trust, but like all that have passed before, they can be overcome. Surely not being part of the conversation presents greater risks.

The next frontier for Public Information and the issue of warnings during emergencies will embrace crowd-sourced and crowd-shared activity. Information will be more visual and easily shared by others, and emergency services will have strong, virtual networks of volunteers and known influencers. As a final note, it is important to say that development of social and digital media channels is by no means the only area for advancement in Public Information management. But it is an important area, and the pace of change and increasing community expectations demand our attention.

For more information, go to www.cubegroup.com.au

GRADALL
HOW TO FURTHER IMPROVE FIREFIGHTING EFFICIENCY AND SAFETY
GRADALL FA FIRE APPARATUS

TWO GRADALL FA MODELS NOW AVAILABLE

Gradall industries is introducing a second Fire Apparatus system, enabling firefighters to extend their reach even further to higher roofs or through walls and windows. FA Systems enable firefighters to drown dangerous fires with water or foam, all with remote controls that can reduce the chance for injury.

- FA 70: Reach over 20 meters, up to the roofs on six- or seven-story buildings.
- FA 50: Reach over 15 meters, attacking fires in buildings up to five stories in height.

Both Gradall FA models use a rugged telescoping, tilting boom and a stainless steel piercing head to smash through wood, masonry or concrete. Fires can be accessed in a fraction of the time required to use conventional methods.

SEE THE GRADALL FA IN ACTION ▶

WWW.GRADALLFA.COM

MTNORMAN@GRADALL.COM 001-1-330-339-2211

ALAMO GROUP GRADALL INDUSTRIES, INC. Where Ingenuity Works

20 Years of innovation at the Pacific Disaster Center

Pacific Disaster Center (PDC) is a U.S.-based program with its headquarters on the island of Maui, Hawaii, which is dedicated to saving lives and securing developmental progress by fostering disaster resilience in countries and their communities around the globe.

Chris Chiesa

The Center achieves those goals through innovative risk assessment applications and multi-hazard disaster monitoring, early warning, and decision support systems. PDC's flagship technology is DisasterAWARE, which is in use by more than 1.6 million people worldwide, including nearly 10,000 disaster management professionals. The Center has actively worked with civilian and military authorities who have hazard- and disaster-related responsibilities in more than 60 countries, and that number is growing rapidly. PDC, now in its twenty-first year, has been managed by the University of Hawaii since 2006.

The development of PDC

PDC was created, at least in part, in response to Hurricane Iniki, which is widely described as the most powerful hurricane ever to strike the Hawaiian islands. Despite Central Pacific Hurricane Center predictions that Iniki would stay well south of the islands, it veered off the forecast path, heavily impacting the island of Kauai on September 11, 1992, doing nearly $2 billion in damage. For almost three-and-a-half years after that, Hawaii's senior U.S. Senator Daniel K. Inouye worked to repurpose space-based imagery libraries, systems of near real-time satellite observation, and other related technologies to meet the needs of disaster managers. He wanted to create an organization that could find ways to apply cutting-edge technology to saving lives. The result was the Pacific Disaster Center.

Since opening in 1996, PDC has been working with a worldwide network of clients and partners to take steps toward a safer and more secure world. To that end, the Center addresses the related needs of decision makers, policy authorities, planners, disaster management professionals, and the general public by employing information and communications technology, analytical science, applied research, capacity building, and the open exchange of information.

PDC specialists have developed generations of multi-hazard monitoring, warning, and decision support tools to facilitate critical information sharing, supporting effective actions throughout the disaster management cycle of mitigation, preparedness, response, and recovery. PDC also conducts advanced risk assessments that integrate hazard exposure with socio-economic factors to define vulnerability and resilience, so the disproportionate impact of events on various populations can be better understood, and then mitigated through improved preparedness and better-informed planning processes.

As climate change drives many aspects of environment and the weather to increasingly dangerous extremes, surging populations and rapid urbanization place an increasing number of people in harm's way, exposed to natural, technological, and human-caused hazards. So, PDC is very much needed, and is required to be a constant innovator, bringing emerging science and technology to bear on challenging disaster management problems.

United Nations agencies, national governments, relief organizations, and humanitarian assistance workers around the world make use of the Center's products and services, and have done so for more than 20 years. Those products and services result from PDC's broad view and positive approach to disaster management, supported by an emphasis on mitigation and preparedness, reducing the demands of response and recovery. Every item in the PDC toolbox is intended to assist in safeguarding lives, property, livelihoods, and economic development.

Early warning and decision support

For more than 20 years, PDC has been leveraging emerging technology and pursuing innovative means of providing the most detailed information about the widest range of hazards to as many stakeholders as possible. Naturally, the development of the World Wide Web in the early 1990s was vitally important, and the NCSA Mosaic browser released in 1993 – while PDC was being defined and initiated – made it possible to offer web-based hazard and disaster information via the internet. In fact, several months before officially opening the Center, PDC analysts and developers began doing that, and it is still the core activity more than 20 years later.

PDC products and services are always changing in response to both needs and possibilities and evolving to use the newest concepts, models, software, and services. Currently, the leading edge in this continuum of technology is the DisasterAWARE platform, a fully integrated, multi-hazard decision support, information exchange, and early warning system. Systems powered by DisasterAWARE have been developed in versions detailed to support users in any situation.

For the general public, there is Disaster Alert, a free-download app for iOS and Android devices, as well as the Global Hazards Atlas on www.PDC.org. Additionally, password-protected versions of DisasterAWARE are in use by disaster managers, national governments, regional intergovernmental organizations, and others. Many thousands of these users rely on the Emergency Operations (EMOPS) iteration of DisasterAWARE, which provides additional functionality and data resources for disaster management professionals.

EMOPS is a highly effective global solution to the need for a common operating picture and near real-time information/information sharing when hazards appear. In some situations, however, there is a need to include

▼ Bangkok-based PDC Southeast Asia Program Advisor Victoria Leat, left, presenting a training-of-trainers in Manila, Philippines, for Philippine Disaster Resilience Foundation (PDRF).

Image courtesy of the Pacific Disaster Center

▲ Staff at the emergency operations center of Indonesia's national disaster management agency, BNPB, monitoring hazards in InAWARE, a custom iteration of PDC's DisasterAWARE.

Image courtesy of the Pacific Disaster Center

Chris Chiesa is Deputy Executive Director for PDC.

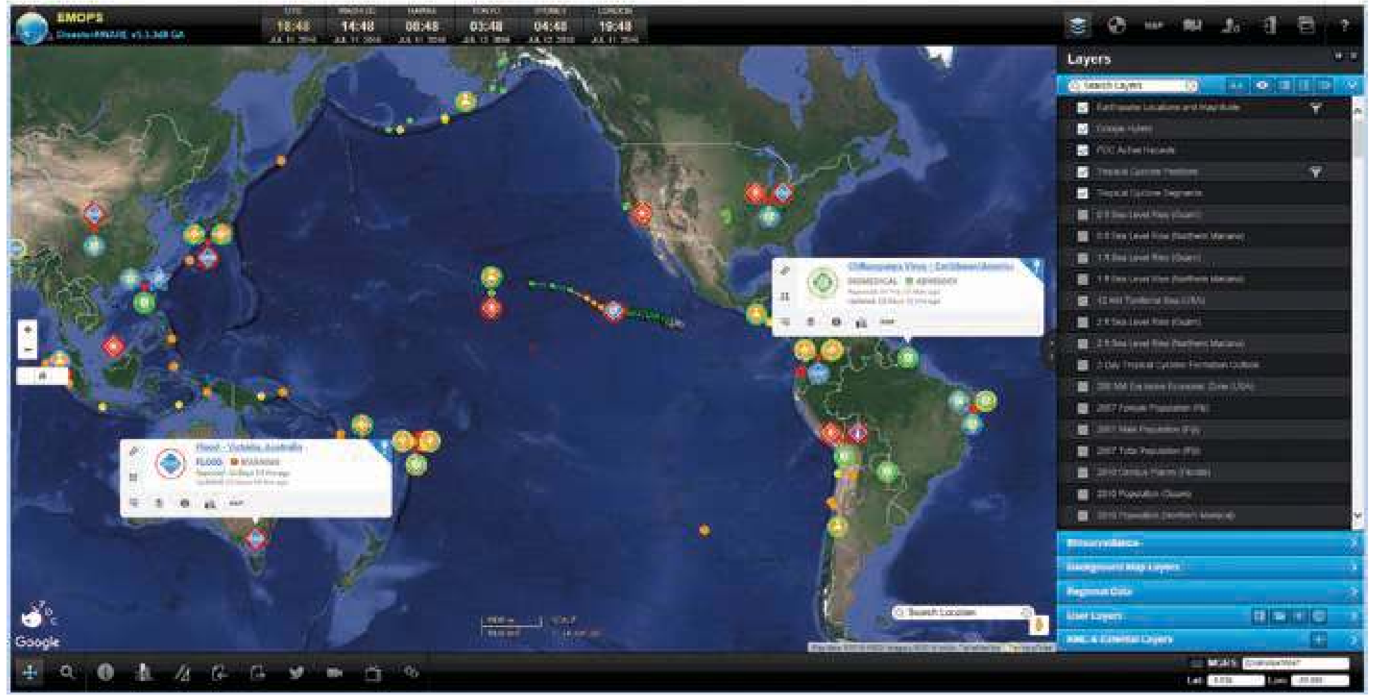


Image courtesy of the Pacific Disaster Center

▲ DisasterAWARE Emergency Operations (EMOPS) system on 11 July 2016 using a Google Hybrid basemap centered on the Pacific and displaying layers visualizing Earthquakes, Tropical Cyclones, and PDC Active Hazards.

other data such as those from national hydrological and meteorological agencies, or to alter hazard severity and warning dissemination rules, or to more narrowly-define the decision making community. For these and various other reasons, custom versions of DisasterAWARE are appropriate for some.

Each customized DisasterAWARE allows that specific disaster management community to support the decision making process before, during, and after disasters. Customized adaptations of DisasterAWARE that have been deployed to-date include DisasterAWARE for NDWC Thailand (2006); VinAWARE for Vietnam (2011); Disaster Monitoring and Response System (DMRS) for ASEAN at the AHA Centre (2012); and InAWARE for Indonesia (2014). New instantiations under development include systems for Nepal and The Philippines, with others for Latin America under consideration. Generally, these custom deployments include both hazard and baseline data from relevant national agencies, and localization of the user interface to support early warning, disaster relief, and humanitarian assistance missions.

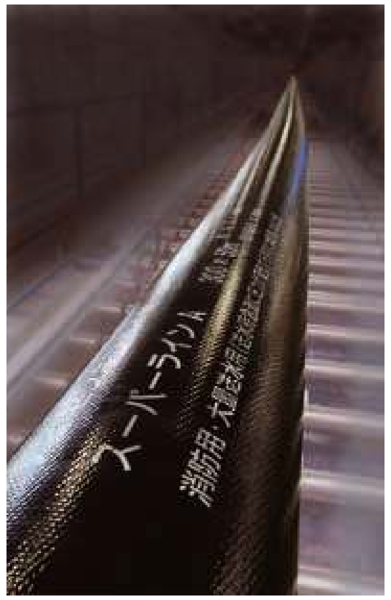
PDC experts support their partners with vital professional services

- Hazard Modeling and Visualization. PDC experts employ a suite of modeling and visualization tools to characterize and assess hazard exposure and potential disaster impacts. While many model outputs are published within DisasterAWARE, other modeling and visualization activities are undertaken to supply exercise scenarios or to help in mitigation and preparedness actions.
- Risk and Vulnerability Assessments (RVA). Multi-hazard assessments help to pinpoint factors that contribute to risk and vulnerability – potential losses – and identify areas where more investment may be needed, perhaps populations with special needs or places where coping capacity needs to be enhanced. Further, RVA allows authorities to more effectively choose among potential mitigation strategies the ones that will be most effective for the specific time, place, and resources.
- Capacity Building through Training and Exercises. From full-scale, professional-level courses of study to single-subject lectures and demonstrations; from foundational knowledge to last-step "training of trainers," PDC is an experienced and proficient training resource. PDC experts also routinely support tabletop exercises, field training exercises, and command post exercises, often using simulations that are presented through DisasterAWARE.
- Strategic Advisory Services. Subject matter experts at PDC have worked with disaster managers in more than 60 countries. They have seen the problems faced by governments and agencies in establishing right-sized, end-user-sensitive disaster management solutions, so they are ready to assist in scaling best-practices to fit needs and to help develop roadmaps for their implementation.

PDC outcomes are achieved through working partnerships. Specialists at the Center work with stakeholders to understand gaps and needs, collaborate with a broad range of data providers to gather information, and partner with academics, scientists, and technologists to develop and implement solutions. PDC knows that both the needs and the resources – people, data, and finances – are specific to each place and situation. So, the Center cannot possibly hope for better partners in establishing disaster management best-practices for any place than the people who call that place "home."

This commitment to the special circumstances of stakeholders has led to the development of a worldwide network of friends who have become part of PDC's permanent and ongoing knowledge exchange.

For more information, go to www.PDC.org



Introduction
TEISEN produced its first firefighting hose in 1903, and since then, it has been the most experienced and largest firefighting hose manufacturer in Japan.

Super Line Large Diameter Hoses
TEISEN offers the Super Line LDH with a diameter of up to 300mm. Super Line LDH is manufactured using a one-piece construction method, extruding the cover and lining in one step, with polyurethane through a polyester jacket.

Features
●Minimized pressure loss
●Compact storage through a new kind of rubber-like, polyurethane material
●Available in long lengths
●Excellent resistance to heat, fuel, chemicals, UV, ozone, weathering, etc.

Diameter	mm	100	150	200	250	300
	inch	4.0	6.0	8.0	10.0	12.0
Color		orange	orange	orange	black	black
Wall thickness	mm	3.5	3.5	4.0	4.6	5.0
Weight	kg/m	1.1	1.6	2.8	4.0	4.8
Burst pressure	MPa	4.2	4.4	3.6	3.0	2.8
Maximum working pressure	MPa	1.6	1.6	1.4	1.4	1.4
Temperature range	℃	-20℃～50℃				

Teisen
TEIKOKU SEN-I CO., LTD.
7F-Yanagiya-Bild, 1-10, 2-chome, Nihonbashi, Chuo-ku, Tokyo 103-0027, Japan
TEL:（81）3-3281-3031 FAX:（81）3-3274-6397
E-mail: teisen-tyo@teisen.co.jp URL: http://www.teisen.co.jp

Simplex

TrueAlert ES speakers

The new sound of safety.

The benefits are loud and clear.

SIMPLEX TrueAlert ES speakers are the industry's first notification appliances with addressable audio. The speakers feature a clean appearance, excellent sound quality and combined fire alarm and PA capability that reduces ceiling clutter. They offer the same design and wiring flexibility as all our TrueAlert ES addressable solutions. You'll benefit from easier testing and maintenance — with less interruption to patients and staff—and the ability to program different announcements for different areas of your facility.

How does that sound?

Copyright © 2016 Tyco Fire Products LP. All rights reserved.
All trademarks and registered trademarks are the property of their respective owners.

Conventional vs addressable fire alarm systems

When it comes to fire alarm systems, the main concern that building owners and managers have is creating a safe environment, occupant safety, property protection and code compliance. When there is a fire breakout, the first thing that owners and managers want to know is the location of the fire so that they can take immediate action and ensure safe evacuation of occupants and reduce risks to assets.

Peter Ryan

Today, most conventional fire alarm systems fulfil these tasks to a degree, but are limited in terms of their flexibility, programmability and level of control provided. Generally, there are two parts to a fire detection system – initiation and notification. With regards to initiation functionality, conventional systems will only be able to indicate the zone or area of the fire, but not the exact location. This affects the ability of the firefighting team to quickly address the fire hazard and may hamper the evacuation process. Whereas an addressable initiation system is capable of detecting the exact location of the fire and notifying first responders. The latest innovations in addressable notification help with more efficient, effective and safer evacuation. Combined with addressable initiation, this enables system designers to design a detection solution that overcomes the specific requirements of each building.

An example of the latest innovations in addressable fire alarm notification systems is the Tyco SIMPLEX TrueAlert ES addressable speakers – the fire alarm industry's first addressable notification appliance with on/off audio control. It allows users to select individual speakers to broadcast unique audio messages, providing unprecedented flexibility and control over emergency messaging and response. As part of the TrueAlert ES series of notification appliances, they also have revolutionary self-test capabilities that can

▼ **Addressable fire alarm speakers offer a solution that is flexible, reliable, cost-effective and highly scalable.**

© Images courtesy of Tyco

Peter Ryan is the Senior Commercialization Manger for Simplex Products. In this global role, Peter champions the sale of Simplex brand fire detection products. His responsibilities include leading new product implementation projects, development of marketing materials, and gathering voice of the customer information to support the development of new Simplex products and services.

help reduce business disruption, as well as be cost and time efficient. Additionally, the speakers have been redesigned with enhanced aesthetics to fit into modern office interiors, whilst providing clear and crisp sound quality, which makes it possible to be used for daily functions and background music.

Targeted messaging for enhanced emergency communications and response

Addressable speakers have the capability to deliver audio messages to specifically targeted areas within a building. Each audio unit has its own address on the fire alarm system and is supervised by a fire alarm panel. As a result, the fire alarm panel can be programmed to select the speaker, or group of speakers, for broadcasting – and what message will be played on them – during an emergency. This targeted audio paging capability enables the delivery of critical, event-specific information exactly where it's needed.

In the case of a small isolated event, an individual speaker can be activated to deliver a message in that specific area, without potential disruption to the rest of the building. For example, if the smoke detector in the kitchen of an apartment in a multi-story residential tower activates, only the speaker in that apartment will be triggered. If additional smoke detectors activate then the speakers for the entire floor can be put into action.

In broader emergency situations, groups of speakers can be used to deliver evacuation instructions for specific parts of the building, based on the nature of the situation. Because audio messages are directed by programming rather than wire runs, addressable speakers are able to offer customers flexibility and total control over the area that they want the message to be broadcasted.

Making it easier and simpler for designers and electrical contractors

With conventional notification, wiring is restrictive and rather inflexible, making it difficult to design systems that are efficient, cost-effective and readily expandable. Addressable speakers (and other addressable notification appliances), in comparison, are far easier for designers to work with. When laying out a system with addressable devices, circuits can be T-Tapped and designed to go further and use wire more efficiently. This gives engineers more freedom and makes it less likely that they will encounter design roadblocks. When put together, addressable fire alarm speakers offer a solution that is flexible, reliable, cost-effective and highly scalable, enabling the system to grow and expand as buildings change and life-safety needs evolve.

◀ The next generation of addressable speakers are aesthetically designed to fit into modern office interiors.

Less disruptive fire alarm testing

Self-testing can reduce business disruption and provide significant time and cost savings, particularly in large buildings where notification appliance testing can be challenging and time consuming. With self-testing systems, work that used to take hours or even days can now be done in a fraction of the time. Addressable speakers offer appliance self-testing capability as well as advanced programming and reporting features. The self-test process takes just seconds to complete. Plus, it can be initiated manually or programmed via the fire alarm control panel to run automatically at a convenient time, eliminating the burden of after-hours testing. If a device fails the test, it will be specifically identified at the panel, simplifying service and repairs. This self-testing process meets the testing, inspection and maintenance requirements specified in NFPA 72: National Fire Alarm and Signaling Code.

This type of notification appliance self-testing has especially big benefits in environments that are constantly occupied. For example, hospitals must adhere to the same fire protection codes as other buildings, while simultaneously minimising disruption to help ensure patient comfort and safety. Faster, less intrusive testing helps these facilities to maintain code compliance with minimal interruption to patients and staff.

Lower cost of system installation and ownership

Addressable notification technology can lower the cost of fire alarm system installation and the cost of ownership over the life of the system. The flexible wiring architecture, combined with greater power efficiency, means less wiring is needed and devices can be installed with smaller gauge, unshielded wire.

Addressable notification systems operate at lower current draws, meaning that they can significantly increase wiring distances and potentially allow more devices to be connected per circuit. Costs may also be reduced because fewer power supplies, notification appliance circuit cabinets and back-up batteries are typically needed over the lifetime of the system.

The future of fire alarm notification

While conventional fire alarm systems may alert you on the area of the fire outbreak, they don't provide the advanced features of addressable fire alarm systems and can cause disruption to the occupants of a building. Home to some of the fastest growing cities in the world, building managers and owners in Asia Pacific should rely on the latest technology to provide next generation precision in locating fires, at the same time improving installation and cost effectiveness from installation and operation to the maintenance of the system.

For more information, go to www.tycofp.com

Innovation, integrity and trust.

Innovation through experience
is at the forefront of what we do.

With over 35 years global fire detection experience in the design and manufacture of innovative fire detection devices, Apollo Fire Detectors are committed to producing trusted and reliable products.

Products are designed, built and tested to the highest British and international standards so you can rely upon Apollo fire detection products ***to protect lives and property worldwide.***

www.apollo-fire.co.uk

apollo

Integrated fire management and community based fire management

Over the last ten years, evidence and results of Community Based Fire Management (CBFiM) from different regions of the globe has led to a paradigm shift to approaches in fire risk management. This shift has focused on better equipping people and agencies with knowledge and skills to manage fire with perceived benefits to communities that are developing alternatives to managing landscapes with and without fires.

Dr. David J. Ganz

Brett Shields

Dr. David J. Ganz is Chief of Party, SERVIR-Mekong, Asian Disaster Preparedness Center.

Brett Shields is Director Asia Pacific, Spatial Informatics Group.

A closer look at the principles of CBFiM and implementation of these in South East Asia shows a consistent gap between these original outcomes being achieved. Effective CBFiM and Integrated Fire Management (IFM) requires a balanced approach between the participating community, government agencies and private companies to draw together the strengths of each group.

This integrated approach is reflected in the Fire Management Voluntary Guidelines published by FAO in 2006. Ideally, this approach would lead to landscape-scale fire management or integrated natural resource management, integrating fire as a vital component of a larger more comprehensive approach. Yet, despite numerous case studies and synthesis documents, the implementation of both CBFiM and/or IFM on the ground has failed to recognise and understand that fire management cannot fully be shouldered by one party or other, nor should it be viewed in isolation of other natural resource management efforts. A balanced approach between communities, government and private sector must be sought and worked upon to achieve a sustainable long term approach.

▼ Local fire fighter mapping up peat fire – South Sumatra, Indonesia 2015.

Image courtesy of Brett Shields

IFM is akin to the now popular Landscape Approach to land and natural resource management, and is aimed at larger landscapes. CBFiM is a small part of the IFM wider coverage, and can be thought of as a nested set of principles and tools that can be used to better work with communities and properly engage them in fire management within the IFM framework.

▶ Peatfire under strong winds – Riau, Indonesia 2016.

Image courtesy of Brett Shields

The underpinning principles of CBFiM were established in 2001 and have since been tested and further refined with documented examples in tropical, temperate and savannah climatic environments. These principles are:

- Fire Management should provide a focus on people and organising them to facilitate fire management, not on equipment or legal constructs.
- Fire Management requires a sense of ownership with people to play an active role. Absence of a sense of ownership erodes interest and motivation to play an active role.
- Fire Management can be adapted to use local and indigenous knowledge, taking caution to ensure that the adaptations can fit within a rapidly evolving environment.
- Fire Management benefits from a focus on prevention actions over suppression actions, and it is recognised that communities tend to facilitate a stronger focus on prevention actions in preference to suppression actions. This is a reflection of human nature to tend toward avoidance damage.
- Fire Management benefits from a balanced approach between the community, private sector, and government agencies participating to draw together the strengths of each group.

Evidence and results of CBFiM implementation in different regions of the globe is invigorating efforts to better equip people and agencies with the knowledge and skills to manage fire. To date, CBFiM has been perceived to offer the greatest benefits to communities, private sector and government agencies that are within developing countries. However a closer look at the principles of CBFiM and IFM adaptation of these principles in developed regions will likely achieve substantial positive benefits as well, including for climate change adaptation.

For instance, in Northern Australia, savannah ecosystems are now providing a model of CBFiM and IFM that has global significance and climate change mitigation.

Savannahs constitute one of the most fire prone ecosystems on earth and contribute significant greenhouse gas emissions globally, yet relatively little attention has been given to them. Despite the minimal attention given, savannahs are a biome with globally significant mitigation potential.

In Northern Australia, the International Savannah Fire Management Initiative has worked to explore further this potential by linking to an emissions abatement program with a direct buyer of carbon offsets. The International Savannah Fire Management Initiative has shown that the strategic reintroduction of traditional, early dry season burning practices can reduce greenhouse gas emissions by more than 30 percent compared to late season wild fires. These efforts are also supporting biodiversity from destructive wildfires and creating meaningful employment and income opportunities for Indigenous communities in remote settings.

With its focus on traditional knowledge and the use of robust methodologies to quantify emission reductions, this is the type of emission reductions that

▼ Haze in Palangkaraya, Central Kalimantan, Indonesia 2015.

Image courtesy of Brett Shields

Image courtesy of David Ganz

◀ Understory prescribed fire by local communities in evergreen forest, Chiang Mai, Thailand 2015.

lends itself to Reducing Emissions from Deforestation and Degradation and Forest Conservation (REDD+). As with REDD+, the conditions required to establish CBFiM and/or IFM projects are not unique to Australia, given the similar landscapes and histories of traditional use of fire among savannah landscapes around the world, including across Australia, Asia, the Mediterranean, Southern Africa and South America. The aim of the International Savannah Fire Management Initiative has three main elements:

a) Raising awareness of the Australian experience internationally;

b) Developing a knowledge base to create a better understanding of the potential of emissions abatement fire management in fire dependent landscapes globally, including through regional feasibility assessments in key savannah regions. These assessments would explore where fire management that draws from traditional knowledge and applies emissions abatement methodologies would be scientifically applicable, as well as the preconditions that would need to be in place for governments and communities to initiate emission abatement fire management projects;

c) Linking interested communities and governments with international experts, raising awareness amongst the international policy and donor community and exploring demand side dynamics.

This example from Northern Australia demonstrates that the nature of the implementation of CBFiM is dynamic. The definition should also be dynamic until the concept matures, and the breadth of work on and experience in CBFiM enables a static, certain definition to be developed. The identification and analysis of CBFiM to date has been in the context of developing and emerging nations. In South East Asia, the identification of cases and best practices has been limited to Vietnam, Laos, Indonesia and recently emerging in Myanmar. Most of these cases are nearing over decade old and deserve a revisit against these baseline assessments. Obviously, there are some key differences between their circumstances and those of developed nations.

In developing countries, the roles of government and private companies and the types of land-use activities differ from those in developed countries. The definition of "community" ("living in a particular locality" or a "community of interest") is essentially different in developed countries. In developing countries, land-use activities are more often tied to personal livelihood and existence, with no other choices available.

Recent examples of IFM and linked community engagement in developed countries could be seen as an element of CBFiM, as the community is increasingly invited to participate in fire management decision-making, and the importance of local knowledge is being recognised and valued. However, there is little evidence that community engagement ensures community empowerment in the context of land use management. In fact, there is no clear, common understanding of community engagement related to land use management. Of note, in developed countries, if CBFiM requires government involvement, it will require considerable resources and training within the organizations and communities involved for effective implementation.

Over the past thirty years, the frequency and intensity of fires in South East Asia has increased. Additionally, haze from forest fires often results in significant increases in respiratory conditions, lung function complaints and other related impacts. Whenever adverse fire weather conditions persist, it is almost a foregone conclusion that severe air pollution and haze events, induced by fire-associated smoke, will ensue in South East Asia and elsewhere. Fire, forestry and climate change professionals need to be looking for solutions to these problems beyond conventional fire management approaches. National and community-based solutions are needed, especially those solutions that engage local communities and NGOs and other stakeholders who are critical to the success of such community-based approaches.

There is a need to apply a Landscape Approach wherein all fires; regardless of its purpose (agriculture, land clearing) are managed in an integrated manner that takes into consideration the needs of nature and people. The reality of utilising a landscape IFM and a nested set of CBFiM principles to fire management is beginning to take hold. Early case examples have been developed in Myanmar and these principles are rapidly evolving today in Indonesia. Land managers of all persuasions can adopt the Landscape Approach and, when considering fire, adopt the IFM and nested CBFiM principles to substantively link government, private and community actors in a meaningful manner.

For more information, go to www.adpc.net

Cutters Edge®

FIRE RESCUE SAWS

The new Dual-Air X-Torq® intake engine technology significantly improves overall cutting performance and meets all Air Quality Control standards at the same time.

MULTI-CUT® Fire Rescue Saw

New 2100 Series includes two engine sizes: 70.7cc and 87.9cc. Each engine is designed for use with Cutters Edge Carbide Tipped *BULLET* Chain® to cut the widest range of materials found at fireground and rescue scenes

CE94 Concrete Cutting Rescue Chainsaw

A new technology 94cc engine and a new style Diamond chain cuts reinforced concrete up to 16-inches thick. Features a lighter weight power head and full-wrap handle for high performance concrete cutting in any position.

MULTI-CUT® H Series Rotary Rescue Saw

New H Series is engineered and powered to work harder and operate longer in the most extreme fire and rescue conditions anywhere. The new technology engine is available in three sizes: 74cc, 94cc and 119cc. The Cutters Edge Black Star and Black Diamond Blades offer long cutting life and high speed cutting of virtually all materials.

BULLETBLADE®

What sets the *BULLETBLADE*® apart is that it can be sharpened and repaired. The new carbide-tipped *BULLETBLADE*® will cut any material any other carbide-tipped blade can cut … and more!

International Contact:
Tel: +1 541 524-9999 FAX: +1 541 524 9996

Email: info@cuttersedge.com
www.cuttersedge.com

The effects of turbulent plume dynamics on long-range spotting

Spotting is a hazardous phenomenon which leads to unpredictable fire behaviour and accelerated fire spread. Spot fires occur when embers are launched by bushfire plumes into the background wind, which then carries the embers a significant distance from the fire front. If the embers land in a suitable fuel bed and are still burning a spot fire may be ignited.

William Thurston

Kevin Tory
Robert Fawcett
Jeff Kepert

Will Thurston has been a research scientist at the Bureau of Meteorology since 2011, where he currently works on the Bushfire & Natural Hazards CRC project "Improved predictions of severe weather to reduce community impact.

The magnitude of the problem is illustrated by Cruz et al. (2012), who provide evidence of long-range spotting in excess of 30 km during the Black Saturday bushfires of February 2009. Therefore a better understanding of the processes that contribute to long-range spotting is essential for the prediction of fire spread. In this study we aim to assess the contribution of turbulent plume dynamics to the process of long-range spotting.

▼ Large smoke plumes from bushfires can allow spot fires to start well ahead of the main fire front.

Image courtesy of Country Fire Authority

Methodology

We use a two-stage modelling approach to calculate the landing positions of potential firebrands launched by bushfire plumes. Firstly, we use the UK Met Office large-eddy model (LEM), described by Gray et al. (2001), to perform numerical simulations of idealised bushfire plumes. A number of plumes are simulated for background winds varying from 5 to 15 m s^{-1}. Secondly, the three-dimensional, time-varying velocity fields produced by the LEM are used to drive a Lagrangian particle-transport model. More than 1.5 million potential firebrands are released near the base of the plume and then advected by the LEM velocity field minus a constant fall velocity of 6 m s^{-1}, representative of jarrah and karri bark flakes (Ellis, 2010). In order to assess the contribution of the in-plume turbulence to the firebrand transport, the time-varying particle-transport calculations are then repeated using a steady-state plume velocity, calculated from the one-hour mean plume fields.

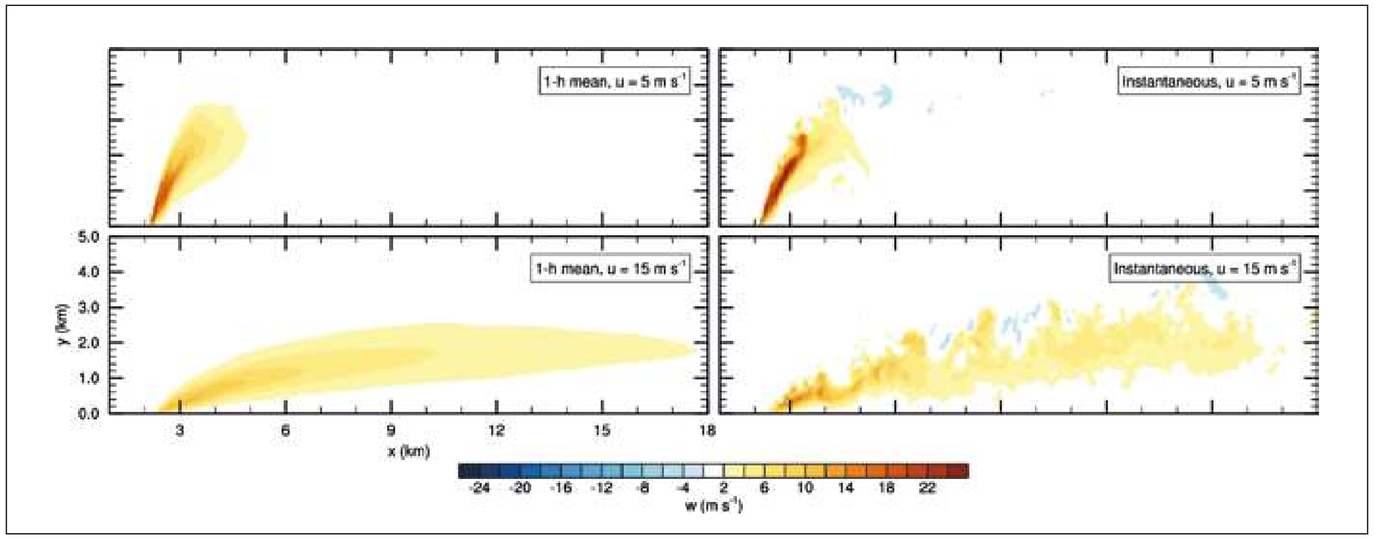


Image courtesy of Bushfire and Natural Hazards CRC

▲ **Figure 1. Vertical cross-sections of the mean (left) and instantaneous (right) vertical velocity, m s^{-1}, through the plume centre line, for background wind speeds of 5 (top) and 15 (bottom) m s^{-1}.**

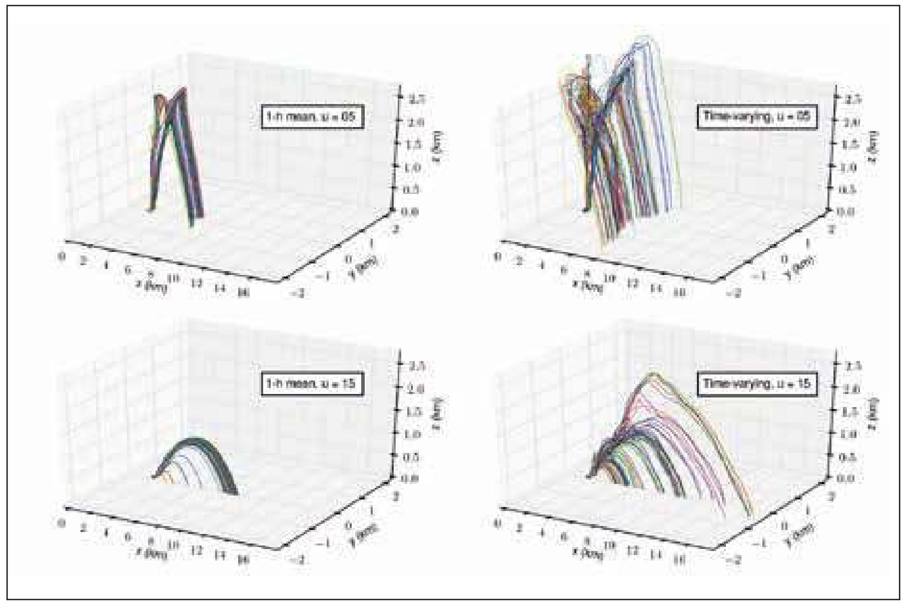
Results

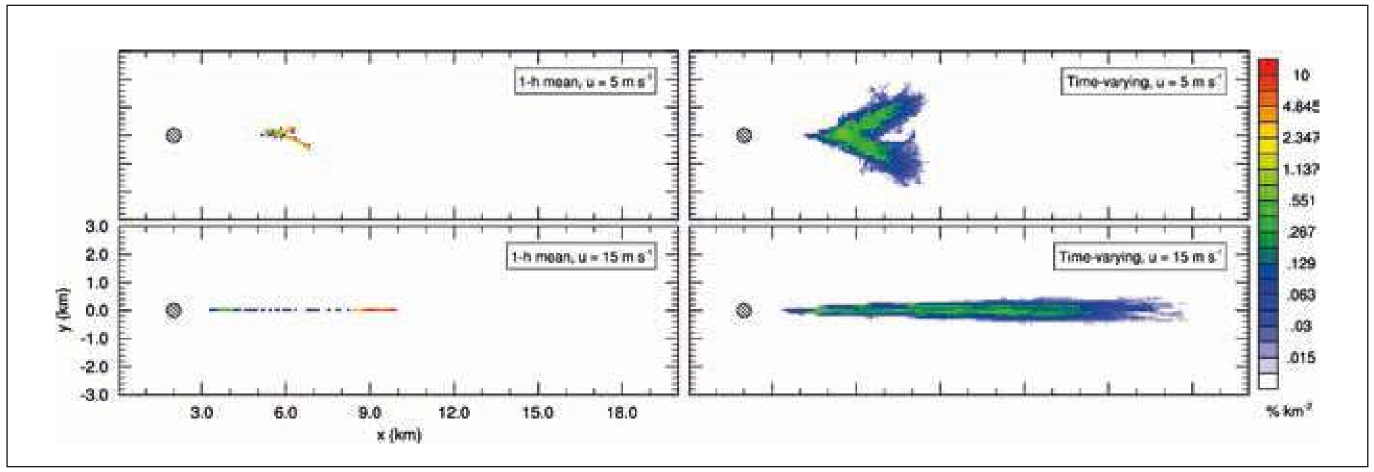
Vertical cross sections of the instantaneous and 1-h mean updrafts for plumes in the 5 m s^{-1} (weakest) and 15 m s^{-1} (strongest) background winds are shown in Figure 1. The instantaneous plumes in strong wind have weaker updrafts, and are more bent over than the plumes in weak wind. The instantaneous strong-wind plume is turbulent over its whole height, whereas its weak-wind counterpart is only fully turbulent above a height of about 2 km. Plan views of the weak-wind plume, (not shown here but seen in Thurston et al. (2014)), reveal that the plume has two updraft cores that form a counter-rotating vortex pair. The 1-h mean plumes do not exhibit any of the turbulence that is visible in the instantaneous plume updrafts, and as a result peak updraft is weaker, but more uniform.

The trajectories of a sub-sample of 100 of the firebrands lofted by each of the plumes in Figure 1 are shown in Figure 2. Firebrands lofted by the time-varying weak-wind plume initially travel up the two branches of the counter-rotating vortex pair, and are then spread out further laterally as they reach the turbulent region of the plume above a height of 2 km. Firebrands lofted by the time-varying strong-wind plume do not exhibit any of this lateral spread, instead landing near the plume centre line. These firebrands appear to be lofted in clumps by the turbulent puffing of the plume, and hence tend to fall out in clusters. The trajectories of firebrands lofted by the 1-hr mean plumes highlight the importance of the in-plume turbulence. In the weak-wind case the firebrands still travel up the two branches of the counter-rotating vortex pair, but there is less lateral dispersion above 2 km. In the strong-wind case the effect of the in-plume turbulence is more pronounced, with most firebrands lofted by the 1-h mean plume now having similar trajectories.

Figure 3 shows the two-dimensional landing distributions for all of the 1.5+ million firebrands launched by each of the plumes in Figure 1. The counter-rotating vortex pair and upper-level turbulence of the time-varying weak-wind plume lead to the firebrands landing in a V-shaped pattern with considerable lateral spread. The landing positions of firebrands lofted by the 1-h mean plume in weak winds still form a V-shaped pattern, but there is less lateral spread due to the lack of in-plume turbulence. Firebrands lofted by the time-varying strong-wind plume travel on average about twice as far as their weak-wind plume counterparts, have more longitudinal spread and less lateral spread in their landing distribution. The landing positions of firebrands lofted by the 1-h mean plume in strong winds show much

▼ **Figure 2. Trajectories of 100 firebrands lofted by the mean (left) and time-varying (right) plumes under background wind speeds of 5 (top) and 15 (bottom) m s^{-1}.**





Images courtesy of Bushfire and Natural Hazards CRC

▲ **Figure 3. Spatial distributions of firebrand landing position (percent of particles launched per km^2) for the mean (left) and time-varying (right) plumes under background wind speeds of 5 (top) and 15 (bottom) m s^{-1}.**

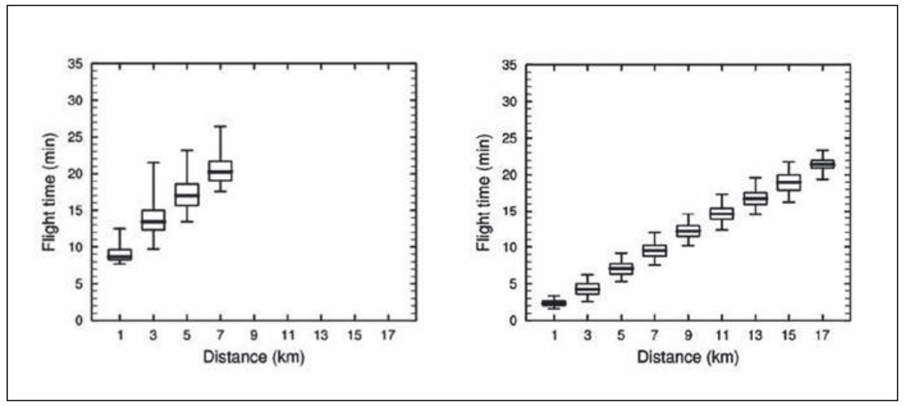
less spread and crucially the maximum spotting distance is reduced by half from about 16.7 km to 8.4 km.

A critical consideration in the potential for firebrands to start spot fires is whether they are still burning when they land. Therefore the flight times of the firebrands lofted by the time-varying weak-wind and strong-wind plumes are presented in Figure 4. Firebrands that are lofted by the weak-wind plume have a relatively long flight time, even if they do not travel a long distance. For example firebrands that are lofted by the weak-wind plume and subsequently travel only 0–2 km are in the air for 7.5–12.5 minutes, whereas firebrands that are lofted by the strong-wind plume and travel only 0–2 km are in the air for 1.5–3.5 minutes. This is caused by the plume dynamics seen in Figure 1; the weak-wind plume is more upright and has a stronger updraft, causing the firebrands to go almost straight up, reach a greater height and therefore be in the air for longer. This behaviour is confirmed by the trajectory plots of Figure 2. The firebrands that have travelled the furthest (16–18 km, in the strong-wind case) have a median flight time of 21.5 minutes and a 1st–99th percentile range of 19.3–23.4 minutes. This is similar to the maximum burnout time of ribbon gum bark observed in the wind tunnel studies of Hall et al. (2015) and would suggest that firebrands taking these trajectories would still be capable of starting spot fires.

Conclusion

We have combined large-eddy simulations of bushfire plumes with Lagrangian particle transport modelling to investigate how turbulent plume dynamics can affect long-range spotting. Plumes exhibited different dynamical and turbulent behaviour depending on the strength of the background wind and this consequently leads to differences in firebrand transport. Plumes in weak winds contain a counter-rotating vortex pair, which leads to large lateral spread in firebrand landing position. Plumes in strong winds are more turbulent and bent over, leading to more longitudinal spread in firebrand landing position and a greater maximum spotting distance. In-plume turbulence was shown to substantially increase the lateral and longitudinal spread in firebrand landing position, and in the case of plumes in strong background winds increase the maximum spotting distance by a factor of two. Systematic studies such as this will inform the development of improved physically based spotting models.

▼ **Figure 4. Box and whisker plots of flight times for firebrands lofted by the time-varying plumes under background wind speeds of 5 (left) and 15 (right) m s^{-1}. Flight times are binned according to the distance travelled by the firebrand, at 2-km intervals. The thick line shows the median flight time and the box spans the interquartile range. Whiskers represent the 1st and 99th percentile flight times.**



For more information, go to www.bnhcrc.com.au/research/bushfire-and-natural-hazard-risks/257

References

Cruz, M. G., A. L. Sullivan, J. S. Gould, N. C. Sims, A. J. Bannister, J. J. Hollis, and R. J. Hurley, 2012: Anatomy of a catastrophic wildfire: The Black Saturday Kilmore East fire in Victoria, Australia. Forest Ecol. Manag., 284, 269–285.

Ellis, P. F. M., 2010: The effect of the aerodynamic behaviour of flakes of jarrah and karri bark on their potential as firebrands. J. Roy. Soc. West. Aust., 93, 21–27.

Gray, M. E. B., J. Petch, S. H. Derbyshire, A. R. Brown, A. P. Lock, H. A. Swann, and P. R. A. Brown, 2001: Version 2.3 of the Met Office large eddy model: Part II. Scientific documentation. Turbulence and Diffusion Note 276, UK Met Office, 49 pp., Exeter, United Kingdom.

Hall J., P. F. Ellis, G. J. Cary, G. Bishop and A. Sullivan, 2015: Long-distance spotting potential of bark strips of a ribbon gum (Eucalyptus viminalis). Int. J. Wildland Fire 24, 1109–1117.

Thurston, W., K. J. Tory, J. D. Kepert, and R. J. B. Fawcett, 2014: The effects of fire-plume dynamics on the lateral and longitudinal spread of long-range spotting. Proceedings of the Research Forum at the Bushfire and Natural Hazards CRC & AFAC 2014 Conference, M. Rumsewicz, Ed., Bushfire and Natural Hazards CRC, 85–94, ISBN: 978-0-9941696-3-15.

MARK-3®

The **MARK-3®** is known as the "heart of the suppression system." Renowned in the industry, the **MARK-3®** was first introduced in 1964 when WAJAX (as ***WATERAX*** was known back then) coupled their patented 4-stage detachable pump end to a 185cc 2-stroke engine. It quickly became the standard wildland portable fire pump used by forestry agencies around the world. A truly outstanding and reliable performer, the **MARK-3®** fire pump is designed to withstand the rigors of firefighting and it is the core of most water delivery systems in wildland operations.

The **MARK-3®** successfully passed the USDA Forest Service 100-hour endurance test at San Dimas and requalified under QPL-5100-274 as of August 2015. It is considered to be an essential piece of equipment used by wildland firefighters across North America and around the world.

TRUSTED BY WILDLAND FIREFIGHTERS SINCE THE 1920'S
WATERAX.COM

WATERAX
WE MOVE WATER®

PERFORMANCE ADVANTAGE COMPANY

TOOL MOUNTING SYSTEMS

What's "NEW" AT PAC in 2016?

CERTIFIED TO NFPA 1901 STANDARDS

All PAC Products Come With A Life-Time Warranty

Toolok-HD
- ✓ Thicker, Stronger Strap
- ✓ Wider Mounting Base
- ✓ New Cushion Design
- ✓ P/N 1003HD

Ironslok Heavy Duty
- ✓ Large Capacity End Modules
- ✓ Wider Mini-Dual Mounting Base
- ✓ Fast-Lok Positive Locking System
- ✓ Capable of Securing The "PIG"
- ✓ P/N K5003HD

RAM Base Mount
- ✓ Fits Both Square & Round Bases
- ✓ Two Sided For Versatility
- ✓ High Strength Composite Material
- ✓ P/N 1022

Call Us At 888-514-0083 For More Information

PACTOOLMOUNTS.com

The preparedness and evacuation behaviour of Australian pet owners

Much of what is known about pet owner behaviour in emergencies in an Australian context is informed by limited or anecdotal evidence, or media reporting of the actions, or inactions, of individuals. In the international disaster literature pet ownership is regarded as a risk factor most consistently associated with evacuation failure and linked to unsafe acts motivated by a desire to rescue animals that have been left behind.

Dr Melanie Taylor

Dr Penny Burns

Dr Melanie Taylor is an occupational psychologist working in risk perception and risk-related behaviour. Dr Penny Burns is a General Practitioner and a researcher working in disaster medicine with a particular interest in physical and mental health in the recovery.

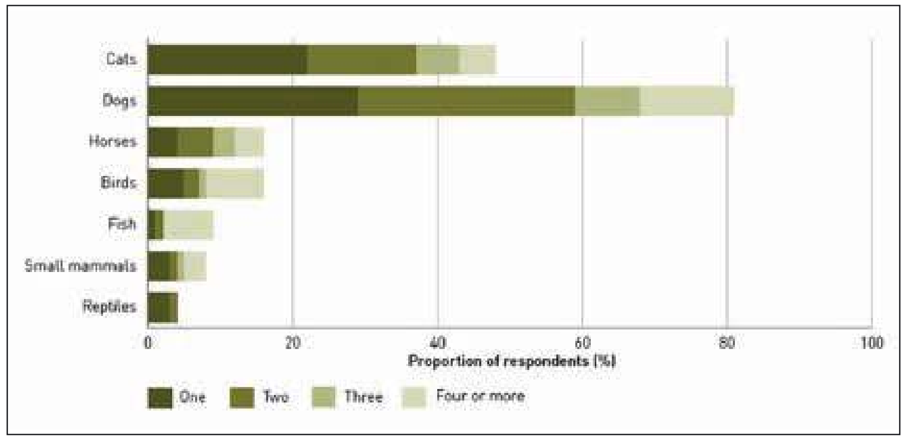
Generally, attachment to pets is high, with many people considering pets as members of the family (White 2012). The strength of this attachment is never more apparent than in the event of pet loss in disaster, with reports of prolonged and often unnoticed or unsupported grief (Blazina, Boyra & Shen-Miller 2011) and poor psychological outcomes, especially in the event of forced abandonment of pets during evacuation (Hunt, Al-Awadi & Johnson 2008). The roles pets and other animals may play in supporting post-emergency functioning and resilience-building are also vital. For these reasons, as well as the implications for public and responder safety during emergency, it is critical that they are considered in emergency management planning.

The primary emergency event, internationally, that led to increased attention to animal emergency management was Hurricane Katrina in 2005, in which more than 50 000 companion animals were abandoned and 15 000 were rescued. Irvine (2009) provides a compelling overview of the scale of the animal emergency management challenge and the film 'Dark Water Rising' (Shiley 2006) provides sobering documentary evidence. Post Hurricane Katrina research indicated that 44 per cent of non-evacuees who chose not to evacuate did so because they didn't want to leave their pets. Soon after Hurricane Katrina the United States Senate passed the Pets Evacuation and Transportation Standards Act 2006 (PETS), which requires states seeking Federal Emergency Management Agency (FEMA) assistance to make provisions for pets and service animals in their plans.

In Australia there is no equivalent

© Image courtesy of Neil Bibby

◀ Firefighters don't have time to look after pets while fighting fires, this will not happen.



▲ **Figure 1: Pet ownership composition at the time of the disaster. Values in parentheses indicate the proportion of the sample owning at least one of that animal type. Values within the bars indicate the proportion of the sample owning different numbers of that animal type. Note: small values (<2%) have not been labelled on the bars and the percent values have been rounded.)**

requirement. Pet ownership levels in Australia are among the highest in the world, with around 63 per cent of households owning a pet (Animal Health Alliance 2013). The need to consider animals and their owners in emergencies has been increasingly accepted in Australia, prompted by large-scale disasters and reports from the 2003 ACT Bushfires Inquiry, 2011 Queensland Flood Commission of Enquiry, the 2009 Victorian Bushfires Royal Commission, and the 2013 Tasmania Bushfires Enquiry. These reports all included references to the management of animals. Many emergency services organisations and other stakeholders involved with emergency management and animal welfare now have strategies and resources available to assist animal owners.

Although the requirement to address a range of issues associated with the management of animals and their owners in emergencies and disasters is now acknowledged in Australia there is a lack of systematic data or evidence available to inform these activities. New Zealand has a small body of research, with one study (Glassey 2010a) reporting that a substantial proportion of pet owners (56 per cent) would not evacuate without their pets and a larger proportion still (81 per cent) would be more likely to comply with evacuation if there were evacuation shelters that could cater for pets. This led to recommendations being made to improve animal emergency management (Glassey 2010b). In Australia research in this area is currently non-existent, although there is increasing discussion with Thompson (2013) positing that the strong bond people have with animals could be used to promote disaster preparedness. This current study was undertaken to assist in addressing the gap in Australian research. The study explores a range of issues around Australian pet owner emergency preparedness for their households and their pets, their actual or anticipated evacuation behaviours in the context of an experienced disaster or emergency, the sources of information used to gain assistance around the time of evacuation, and lessons identified from the experience.

Method

A questionnaire was developed to assess pet owner characteristics, emergency and evacuation contexts, evacuation experiences and preparedness. To meet study inclusion criteria respondents needed to have experienced 'a disaster or local emergency in which they evacuated, or considered evacuating their home', to have been a pet owner at the time of the disaster, and to be aged over 18 at the time of completing the survey.

The survey was administered using the online survey-hosting platform SurveyMonkey™. A link to the survey with a short invitation to participate was distributed using a combination of social media (Facebook and Twitter), online and print media, and a University of Western Sydney media release. The link on social media was reposted by a number of animal rescue and similar special interest pages. Data were collected over an eight-week period (22 Jan – 22 Mar 2013).

The study was approved by the University of Western Sydney Human Research Ethics Committee (Approval No. H9993).

Data were analysed using IBM SPSS software (V.21). Simple descriptive statistics, frequencies and cross-tabulations, have been reported here to produce a concise overview of the survey findings.

Results

Sample characteristics

In total, 352 pet owners met the study inclusion criteria and are represented in the analysis. The majority of the sample was female (89 per cent) and 86 per cent were aged between 25 and 64 years.

Respondents came from all states and territories with the largest groups from Queensland (51 per cent) New South Wales (25 per cent), and Victoria (12 Per cent). Two-thirds of the sample lived in suburban and rural areas (35 per cent and 32 per cent respectively).

Pet ownership

Respondents were asked about the composition of their pet ownership and their attitudes to their pets. At the time of the emergency, 79 per cent of respondents owned one or more dogs and 49 per cent owned one or more cats. Figure 1 shows the breakdown of the numbers of pets owned by respondents.

Figure 1 shows the complexity of household pet ownership. In total, only 18 per cent of respondents owned one pet; the majority of those (72 per cent) owning a dog. Just over a quarter (26 per cent) owned only one animal type, but multiples of them, and the remainder (57 per cent) owned multiple types of animal. A small proportion of respondents (4 per cent) were running animal-related home-based businesses or enterprises that involved large numbers of animals. These were mostly breeding or rescue and rehoming enterprises, and a few respondents were wildlife carers.

Overwhelmingly, pet owners felt a high degree of responsibility for their pets and a strong attachment to them (with mean ratings of 9.84 and 9.76, respectively on 10-point scales for each). Most respondents strongly agreed that they considered pets to be part of the family (86 per cent), that their pets made them happy (86 per cent), and that they were great companions (88 per cent).

TEXAS A&M ENGINEERING
TEEX
EXTENSION SERVICE
The International
Fire & Emergency Training Leader
TEEX trains emergency response personnel from more than 45 countries each year!
Choose from over 130 courses including:
• Firefighting
• Emergency Medical Services
• Fire Investigator
• Fire Officer / Instructor
• Hazardous Materials Response
• Rescue / Urban Search & Rescue
• Industrial Emergency Response
• Marine / Oil Spill Response
• LNG Emergency Response
• NIMS / ICS
• Annual Spanish School
• Latin American Emergency Response
• Leadership
Each course can be tailored to meet your exact needs in a variety of areas
Schedule your classes and
Experience the HEAT!
C13.6627.02
1-866-878-8900
www.teex.org/fire

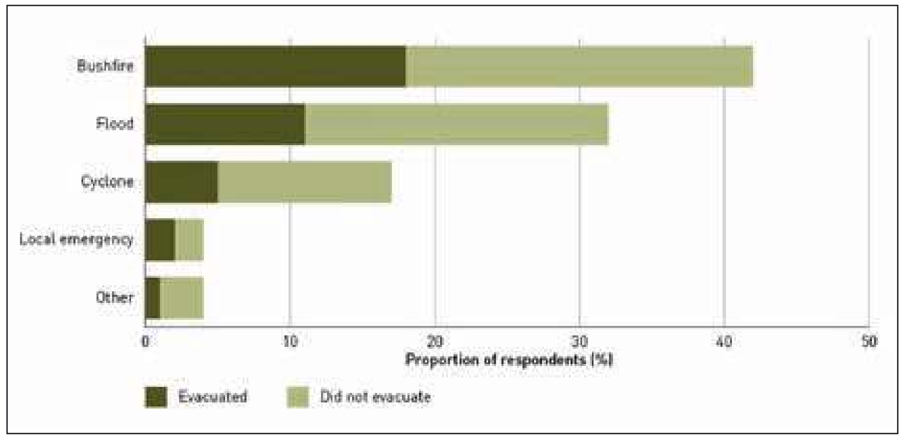
DID YOU KNOW...
despite 60% less traffic on the road, almost 50% of all auto accidents happen at night
a light tower is the most cost effective way to keep personnel safe on night scenes
the higher you put a light source up in the air, the less intense the light is at ground level
most Command Light towers elevate 7-11 ft, high enough to prevent shadows, but low enough to maintain light intensity at scene level
all electric Command Light towers are not affected by wind, freezing drizzle or the harshest conditions
reliability is assured with testing to 90 mph and an industry leading 5 year warranty
COMMAND LIGHT
ft collins, co
commandlight.com

Disaster and evacuation contexts

As data in this study do not relate to a single specific disaster or emergency event, evacuation behaviours are reported in relation to a range of hazard types. Figure 2 summarises the disaster and emergency situations encountered by respondents and their pets, i.e. the single event about which they provided information in the survey. This figure also includes data on the proportions that did/didn't evacuate in that event.

With regard to the timing of these events, more than half (56 per cent) occurred since 2011, and more than 70 per cent since 2009. Most respondents provided details of the events they experienced, with the 2011 southeast Queensland floods, 2011 Tropical Cyclone Yasi, 2013 Bundaberg floods, and 2009 Black Saturday bushfires mentioned most frequently.

▼ **Figure 2: Disaster and emergency situations reported by respondents and the proportions that did/didn't evacuate. Values in parentheses indicate the proportion that experienced each type of disaster/emergency. Values within the bars indicate the proportion evacuated – either fully or partially, or didn't evacuate – either prepared to or didn't prepare to. Note: percent values in the bars have been rounded.**



In response to these events, 31 per cent of respondents evacuated with their entire household, 6 per cent partially evacuated, 36 per cent prepared to evacuate but didn't actually go, and 27 per cent didn't evacuate or prepare to evacuate. Of those who reported that they were advised by authorities to evacuate (31 per cent) 70 per cent did so.

Just over a quarter of respondents (27 per cent) had less than three hours to evacuate. As would be expected, the hazard type influenced the amount of time available to evacuate; 60 per cent of those who experienced a local emergency and 23 per cent of those who experienced a bushfire had less than one hour to evacuate, whereas of those who experienced flood, 18 per cent had between three hours to a day to evacuate, and 24 per cent of those who experienced a cyclone had more than a day.

Over a half of respondents who evacuated (58 per cent) were away from home for less than two days, and a fifth were unable to return for two-five days (21 per cent), or more than five days (21 per cent). Again, the hazard type influenced how long participants were away from home. Approximately two-thirds of those who evacuated due to bushfire or cyclone were able to return in less than two days (67 per cent and 64 per cent, respectively) compared to only 37 per cent who experienced flood. Flood-impacted pet owners were the most likely to be away from home for more than five days (34 per cent) compared to those who experienced bushfire and cyclone (14 per cent and 7 per cent respectively).

Evacuation experiences

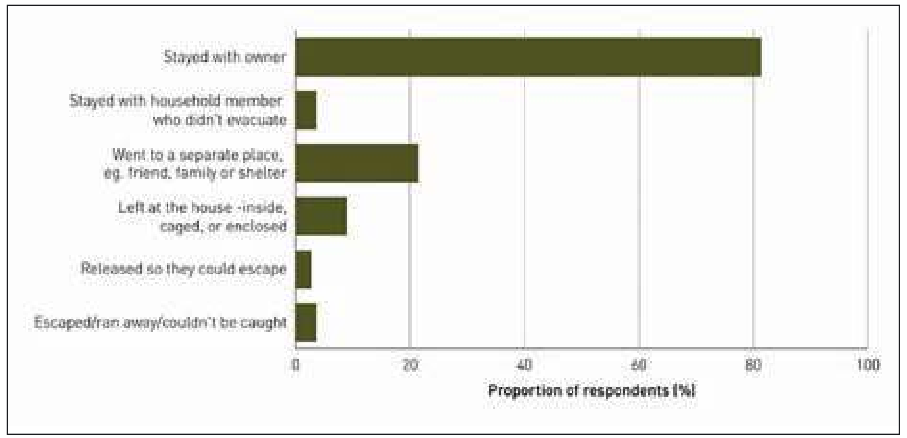
A total of 122 respondents evacuated (fully or partially) and data in this section relate to this subsample.

When people evacuated their homes many things happened to their pets. Figure 3 summarises what happened to the animals.

Respondents were asked why some pets weren't evacuated with them. Comments included respondents not being able to catch or contain them, being told they couldn't take them/take them to evacuation shelters, that it was too hard to take them, that they died, and that there were too many to take.

Over two-thirds of respondents who evacuated stayed with family or friends (69 per cent), and smaller proportions stayed at an evacuation shelter (5 per cent), hotel/guest house (4 per cent) or showground/campsite (3 per cent). Those who stayed elsewhere (18 per cent) mentioned staying in cars/utes, with neighbours, and at schools or workplaces; some reporting they stayed in cars because evacuation shelters wouldn't accept pets.

When asked about how owning pets influenced evacuation, significant proportions of the sample strongly agreed or agreed that having pets influenced where they went after evacuation (81 per cent), their decision about whether to evacuate (72 per cent), increased the stress of evacuation (68 per cent), and the mode of transport they used (66 per cent). In addition, having pets influenced the number of trips made to and from home during evacuation (54 per cent) and slowed down the speed of evacuation (43 per cent).



◀ **Figure 3: What happened to pets when households evacuated. Note: due to the complex composition of pet ownership respondents could select multiple categories.**

Preparedness

Those who evacuated were also asked if they contacted anyone for immediate assistance (help or information) with evacuation of their pets. More than half (58 per cent) contacted no one, 30 per cent contacted neighbours or friends, nine per cent asked for help via social media, eight per cent contacted emergency services, and the same proportion contacted local council, local veterinary clinics and online sources for help, (six per cent for each).

Respondents were asked to reflect and report on how prepared they felt they were prior to the disaster/emergency event. Figure 4 summarises these data.

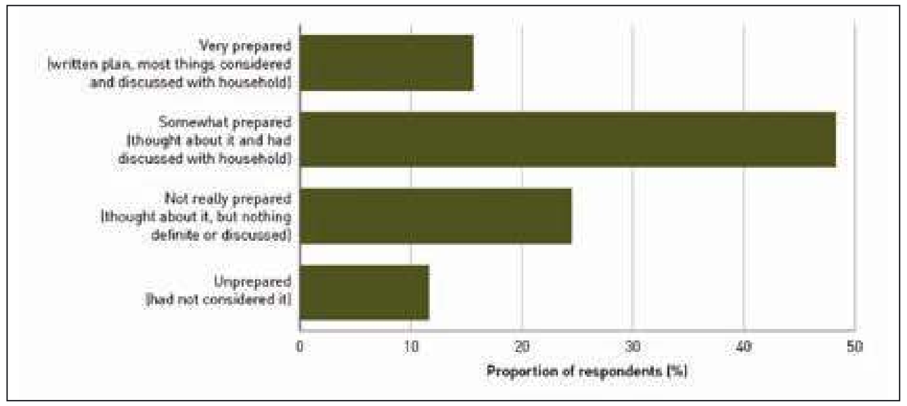
When asked about consideration of pets in evacuation planning, high proportions of those who reported being 'very' or 'somewhat' prepared had considered all their pets (96 per cent and 87 per cent respectively). Similarly, most owners planned to keep 'all' their pets with them when they evacuated (74 per cent), a further 21 per cent planned to keep some with them and take others to a different location, and only one per cent did not plan to take their pets.

Discussion

This study provided details of pet owner experiences during Australian emergency events; their preparedness, and their actions. It is clear that household pet composition is often complex, with the majority owning multiple animals of multiple types. In a disaster or emergency situation this translates to complex evacuation scenarios, with different pets with different needs; practical considerations, transportation, and destinations. With a third of the sample reporting they were unprepared before the disaster, this emphasises the need for higher levels of preparedness, planning, and discussion.

The experiences reported in this study suggest that certain hazards are more likely to result in different challenges for pet owners. Time to evacuate is likely to be shorter for bushfires and local emergencies, requiring unimpeded execution of evacuation plans, whereas time away from home is likely to be longer in the context of flood, meaning that the probability of leaving pets at home with food for a few days is less likely to be an acceptable strategy.

Clearly all disasters are different and official advice should still remain as 'be prepared, act early, be considerate and act safe' (Australian Government 2014). However, the reality is that animals do get left behind. In this study approximately 15 per cent of the sample left some animals at home either because they were deliberately left in the home or they were released to escape, or they could not be caught. Perhaps more concerning is that comments indicate some households only partially evacuated so that they could leave someone behind to take care of the animals whilst the rest of the household evacuated.



▲ **Figure 4: Reported level of preparedness prior to the disaster/emergency.**

The influence of pets on decision-making and the process of evacuation cannot be underestimated. Data from this study indicates that for the vast majority of pet owners their pets influence where they go and their decision to evacuate. In addition, pets may determine the mode of transport they use, the time it takes to leave, the number of trips that are needed, and increases the overall stress of evacuation. Even with these encumbrances pet owners will still take risks to take, or go back and get, their animals. The consequences of not taking such action are too unbearable to contemplate for many.

Finally, the importance of family and friends to help support evacuees with pets is highlighted in this study. No doubt this is an important resource for all those who need to leave their homes in an emergency. However, pet-friendly destinations are a necessity for pet owners. Most people plan to take their pets if they evacuate and do take their pets with them. If options are not available to accommodate pets then owners will either sleep in cars or other makeshift places, or will simply decide not to evacuate.

Strengths and limitations

This study provides useful Australian data to inform those involved in the management of animals and their owners in disasters and emergencies. The sample size is sufficiently large to provide confidence in the data across a range of different hazards and provide insights into pet owner levels of preparedness for their pets, the rationale for their decision-making, and their priorities and considerations for evacuation and relocation. However, the study also has limitations. The sampling strategy for the study was uncontrolled and self-selected, which can result in biases and cannot be considered representative of all pet owners. Clearly many respondents were extremely attached to, and passionate about, their pets; 'animal lovers' more than simply 'animal owners'. However, from an emergency management perspective such people are important, as these are the people most motivated to protect their pets and potentially the most likely to take risks to evacuate with them and return for them. It is also clear that most pet owners consider their pets as part of the family (Glassey 2010a) and data in this study does not differ significantly to suggest this sample is more biased in this regard. Pet ownership is, in most part, an optional undertaking. Therefore it should be expected that the majority of pet owners will feel committed and attached to their animals.

Conclusion

This study has provided a snapshot of Australian pet owners and their behaviours in, and preparedness for, emergencies. The findings of the study should inform planning by emergency management agencies and other stakeholders, on the behaviours and expectations of pet owners, on animal management needs in evacuation centre planning, and on future community engagement campaigns.

MADE IN THE USA

QUALITY KNOWS NO EQUAL

In 1987, Tempest became the first positive pressure ventilation fan used in firefighting. Today, we're proud to say we're still the most used and most trusted.

Tempest Technology Corp.
www.tempest.us.com

SAPHIRE CREATORS OF TRAINING HARDWARE

Gas and wood-fired training facilities - Hybrid training - Flashover unit - Nozzle unit - Emission control - STCW 2010 & Offshore/ Maritime training facilities

Nozzle- Flashover-unit, Royal Netherlands Navy NL

ETU, Istanbul Fire Department TR

SAPHIRE-CTC is building up a global reputation as a valued developer and manufacturer of standard and XpertBuild training modules. One of SAPHIRE-CTC's unique characteristics is that it offers services to a range of industries including the world of fire-fighting, renewable energy industry and the offshore- and maritime industry. Visit our website to view our range of products and services.

Live fire building, Oefencentrum Crailo NL

START SAVING LIVES

SAPHIRE Complete Training Concepts

WWW.SAPHIRE-CTC.COM

A heatwave classification for heat related fatality risk

Research undertaken by Risk Frontiers shows that heatwaves are responsible for the largest number of deaths in Australia from natural disasters (Coates et al. 2014). In particular the South East Australia Region has been affected by 6 of the top 10 most deadly Australian events since the beginning of the 20th century.

Thomas Loridan

Thomas Loridan is a lead scientist at Risk Frontiers who specializes in atmospheric hazard modelling with a particular emphasis on Tropical Cyclones (TCs). He holds a PhD from King's College London where he studied models of the urban boundary layer. In the past 5 years Thomas' work has led to the development of various techniques to simulate the variability in severe winds observed from TCs across the world's most active basins. More recently Thomas' research has also focussed on developing risk metrics for heatwaves in Australia.

Surprisingly given this death toll the tools available to communicate about heatwave risk are far less advanced than for other life threatening natural disasters such as tropical cyclones or bushfires: there is as yet no consensus about what constitutes a heatwave event (Perkins 2015) and more transparent ways to inform the community about risk levels are clearly needed. Recognizing this, the Bureau of Meteorology (Nairn and Fawcett, 2015) recently designed a heatwave severity index that takes into account both the ability of the local community to adapt to its climate and the impact of sharp temperature spikes preventing acclimatisation. Using this index, called Excess Heat Factor (EHF), the Bureau proposed a heatwave severity classification scheme that distinguishes low intensity, severe and extreme events. Although this approach is a natural step towards better risk communication, the implications of a high EHF are very dependent on the risk being studied. For applications such as energy demand or infrastructure damage the threshold value above which action needs to be taken will differ significantly from values that can trigger, for instance, human discomfort. We here focus on heat related fatalities and aim to address the following: knowing the peak intensity and accumulated heat load during a heatwave, can we anticipate its impact on human lives?

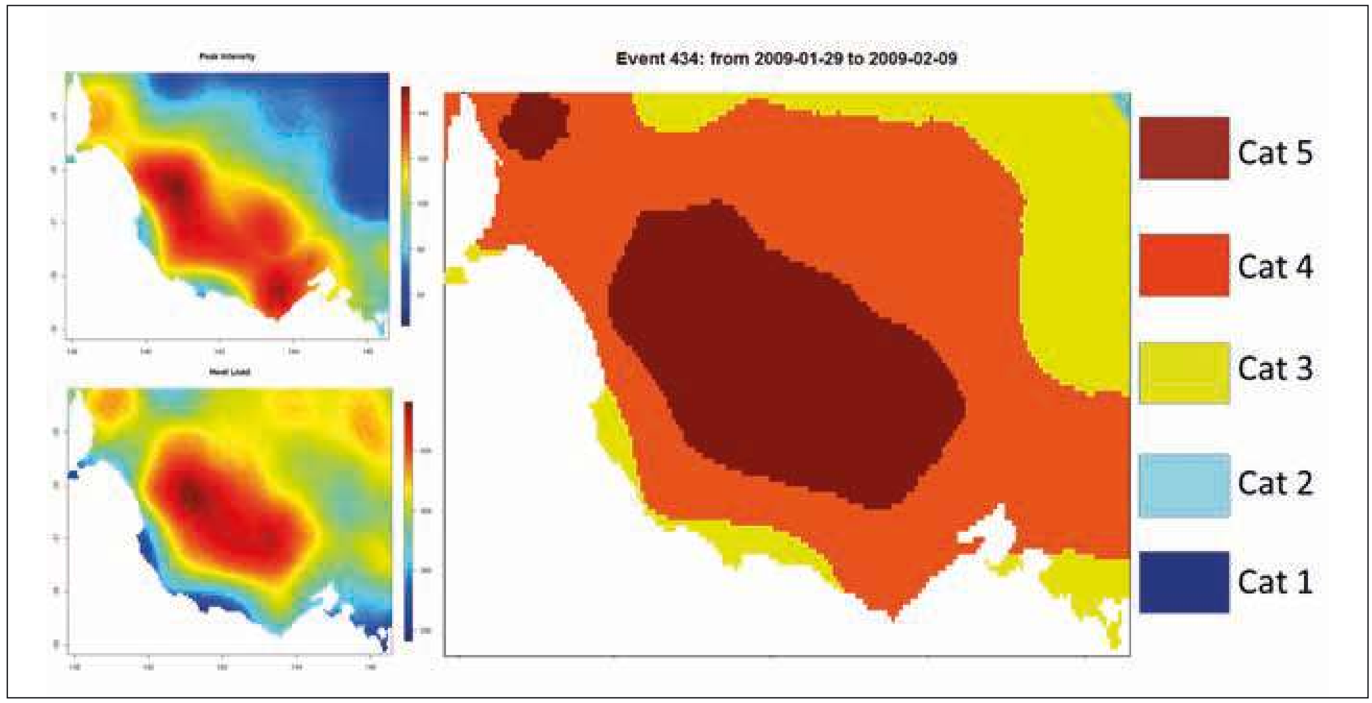
Defining new hazard intensity categories for heat-related fatalities

To specifically link heatwave intensity to heat related fatalities we combine two data products. Risk Frontiers' PerilAUS archive (Coates et al. 2014) allows extraction of 224 historical occurrences of events with heat-related deaths in Australia, and for each we exploit gridded records of daily minimum and maximum temperature available from the Bureau of Meteorology since 1911 (Jones et al. 2009) to compute EHF estimates. Ranking the most lethal heatwave episodes in terms of heat accumulation (i.e. the heat load, EHFsum) and peak intensity (EHFmax), we define five new severity categories (Table 1). These categories capture conditions that historically led to a higher number of deaths and acknowledge that the most dangerous events will be characterised by both a large peak intensity and a sustained period of severe heat.

To illustrate how this classification can be used we analyse the January – February 2009 heatwave that killed more people that the Black Saturday bushfires taking place during that same period. The footprints of EHFmax and EHFsum (Fig. 1, left) are used to create spatial patterns of the categories following the schema given in Table 1 (Fig. 1, right). The resulting category map allows direct representation of the risk gradient across the event and should enable more efficient risk communication.

▼ Table 1: Criteria for the classification of heatwave event intensities. Both criteria (columns 2 and 3) must be satisfied.

Category	EHFsum	EHFmax
CAT0	> 0	> 0
CAT1	> 30	> 15
CAT2	> 80	> 30
CAT3	> 150	> 50
CAT4	> 300	> 70
CAT5	>450	>100



Images courtesy of Risk Frontiers

▲ Figure 1: Footprint of peak EHF (EHFmax, top left) and heat load (EHFsum, bottom left) for the January-February 2009 event along with the corresponding Table 1 heatwave severity categories (right).

Developing an EHF-based vulnerability function to project fatalities

To help quantify the risk to human life associated with each of the Table 1 categories, a vulnerability function is derived using census population data from between 2001 and 2011 to normalise the fatality records. The vulnerability development is restricted to that period and the focus is on the Victoria / South Australia region, given the higher quality of information available.

For the 10 biggest events of the period the total population exposed to each of the categories listed in Table 1 is computed, linearly interpolating between records from 2001 and 2011. The corresponding fatalities reported in that same exposed area are then totalled and normalised by the population exposed to derive a death rate by category. Figure 2 shows the expected number of fatalities per 100,000 people exposed for each category.

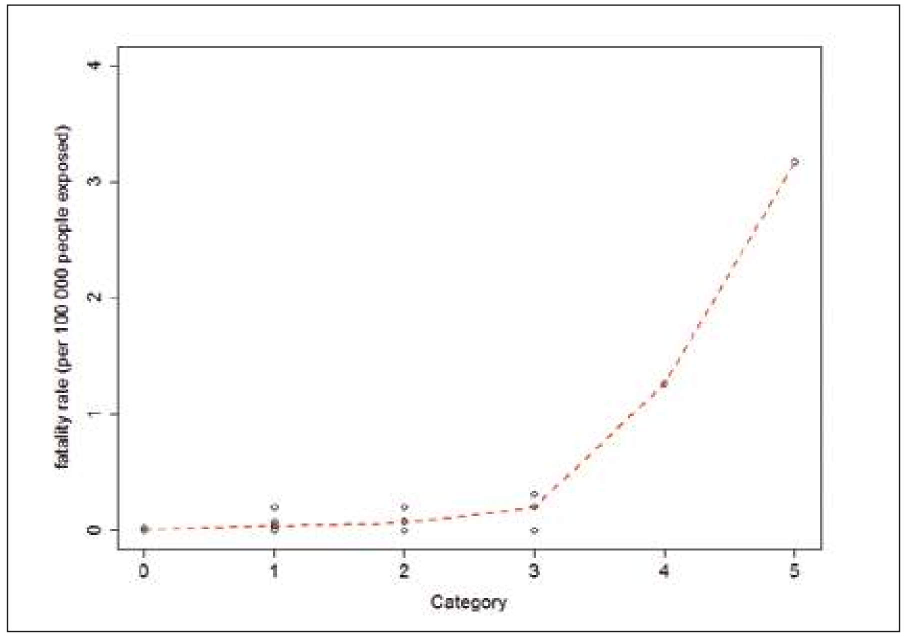
As all estimates in this study are based on reported fatalities, and because of under-reporting and the likelihood of wrongly categorising deaths to other health-related issues rather than heat stress, a large uncertainty surrounds this fatality curve and all projections should be interpreted as lower bound estimates.

Conclusions

The Excess Heat Factor (EHF) heatwave intensity framework was used in combination with an archive of heat-related fatalities in Australia to provide indicators of heatwave severity. This led to the definition of five severity classes that may be helpful in characterizing and communicating the death potential of heatwaves. In an attempt to quantify heatwave impact beyond the hazard threat, a vulnerability curve is defined to estimate the number of human fatalities to be expected as a function of both the heatwave risk category and the population density. Although our fatality projections are very uncertain the relative increase in magnitude from one category to the next can serve as a powerful communication tool and help communities anticipate the threat to human lives posed by the most extreme heatwave events.

For more information, go to www.riskfrontiers.com

▼ Figure 2: Rate of fatalities per 100 000 people (y-axis) as a function of the heatwave category they are exposed to (x-axis). Individual dots represent distinct events while the red dashed line is the expected estimate, representative of all-events combined.



FREE Subscriptions

Gulf Fire

Gulf Fire Magazine is the only quarterly journal specific to the Middle East Fire market dedicated to both fire protection and firefighting. The editorial features are written by industry experts and comprise a unique blend focussing on the latest technology, training methods and equipment as well as highlighting sector specific issues. Regular product and company profiles, events updates and news make Gulf Fire Magazine the first choice read for fire protection and firefighting professionals.

www.gulffire.com

Gulf Fire
نار الخليج
REPORTING TO THE MIDDLE EAST FIRE PROTECTION INDUSTRY AND FIRE SERVICES

IFP INTERNATIONAL FIRE PROTECTION MAGAZINE

IFP Magazine is the only international journal dedicated to fire safety, prevention and protection covering every aspect of the passive and active fire protection market. The editorial features are written by industry experts focusing on the latest technology and equipment as well as highlighting sector specific issues from around the world. Regular product and company profiles, events updates and news make IFP the first choice read for fire safety professionals.

www.ifpmag.com

IFP
INTERNATIONAL FIRE PROTECTION MAGAZINE
THE GLOBAL VOICE FOR PASSIVE AND ACTIVE FIRE PROTECTION

INTERNATIONAL FIRE FIGHTER

IFF Magazine is the leading global publication for municipal and industrial fire fighters and the fire and rescue industry. The editorial features are written by industry experts and comprise a unique blend focussing on the latest technology, training methods and equipment as well as highlighting sector specific issues from around the world. Regular product and company profiles, events updates and news make IFF the first choice read for fire and rescue professionals.

www.iffmag.com

INTERNATIONAL FIRE FIGHTER
REPORTING TO MUNICIPAL, INDUSTRIAL AND FIRE TRAINING PROFESSIONALS
ISSUE 50

Written by Fire Professionals for Fire Professionals

PTG and PTS – reflecting on the trauma response of growth amongst the decline

For those involved, in any capacity, with the Victorian 2009 'Black Saturday' bushfires your experiences and losses are respectfully acknowledged. The lives of thousands of people, animals, businesses and places were decimated on the day and during the aftermath. The costs and consequences continue. The magnitude and impact is individually and nationally significant.

Rhonda Abotomey

In a 2009 Victorian Bushfires Royal Commission public consultation, Rhonda Abotomey raised her survivor's voice imploring the Commissioners to approach the inquiry as Ambassadors for Common: -for common sense, common decency, compassion, communication and community.

As part of Rhonda's trauma response to losing three family members in the bushfires, she has become a passionate advocate for improved trauma preparedness and recovery. She was a Victorian Bushfires Royal Commission witness, member of the VBRRA Bushfire Bereaved Advisory Group (BBAG) and co-author of the BBAG legacy document.

In 2012, while continuing to navigate Black Saturday's aftermath, Rhonda first heard the term Post-Traumatic Growth – it was a defining 'light-bulb' moment. In 2013 she partnered with a team of University of Melbourne researchers on a project titled Reconceptualising and supporting disaster recovery as growth: Informed by people affected by the Victorian 2009 'Black Saturday' Bushfires.

This writing shares a trauma insider's account, delivering a message of universal applicability and value. Posttraumatic growth (PTG) information is relevant to workers, volunteers, individuals and organizations interested in preparedness and recovery from events involving direct or vicarious trauma exposure. This paper is about the importance of posttraumatic growth knowledge, its value as a resource for trauma management toolboxes, and the opportunity it provides to generate benefit in all manner of traumatic events:- fire, flood, drought, storm, man-made events and more.

Context

Tragically 173 people died from the 2009 Black Saturday fires, including three of my family members. Not surprisingly, this experience induced significant trauma caused decline with health, personal and work impacts and posttraumatic stress (PTS). Surprisingly, amongst the negative impacts and reactions to that catastrophe I also experienced positive personal transformation – posttraumatic growth – PTG. Undeniably it is a paradox: hope and capacity generated within the hell and incapacitation.

In short, PTG and PTS have been integral, intertwined parts of my trauma reaction to losing three family members, their home and their business during the Black Saturday fires. Bottom-line: I am very thankful for the posttraumatic growth for without it the losses and decline would have been even more challenging.

No PTG words, no information, missed recovery opportunity

Almost four years after Black Saturday I first heard, by accident, the words posttraumatic growth. I was informed that PTG is a formally recognized term. Indeed, this trauma response is professionally acknowledged; there is research supported evidence. Up until that accidental moment of learning I didn't appreciate that trauma could be positively transformative as a normal part of a person's complex reaction to trauma. I never anticipated, nor was prepared for, trauma induced growth. I did not understand the entirety of my trauma reaction or have PTG resources or examples from other people to draw upon, or the terminology and language to voice what was occurring.

Indeed, between 2009 and 2012, despite being actively engaged in the Black Saturday recovery space, including extensively with the Victorian Bushfire Reconstruction and Recovery Authority and with the government established Bushfire Bereaved Advisory Group, and despite receiving lots of information about trauma impacts, never once were the words posttraumatic growth mentioned by any person, agency or government department. I look back and think how illogical. How was that possible? There was so much missed opportunity to help people! I would have welcomed the words, explanation and examples of PTG. There was a lot of helpful and important official support and information about trauma, and the incapacitating impacts, but all of it one-sided, all failing to ever mention PTG. The PTG silence was systemic, from individuals to disaster response agencies and government. That was not helpful at all.

For recovery, I needed my whole trauma experience acknowledged, not just the incapacitating side. But incapacitation was the total focus. Because of the vacuum of PTG information or conversation, I stayed fairly silent about my PTG. To be honest I felt conflicted and somewhat guilty that some good came out of something so horrendous. Obviously I would never have chosen to grow in this way. Nonetheless, the disaster happened and as a person I both declined and grew.

No society is immune from traumatic events. Common sense alone suggests that being educated and prepared for the range of trauma reactions a person may experience matters! This makes PTG knowledge transfer important not only for recovery but also critical in preparedness and capacity building initiatives.

Acknowledgement of trauma reactions

Posttraumatic Stress – PTS – from disasters is known and acknowledged but Posttraumatic Growth – PTG – seems practically invisible as a term.

Hardly anyone seems to know about, or use, the PTG term or words. This represents a deterrent. It is easy to appreciate that trauma impacted people, unfamiliar with the PTG term, either don't have the needed simple or normalized language to describe what is happening to them, and/or they end up feeling reluctant to mention 'trauma growth' because others are silent. This breeds stigma.

Acknowledgement of PTG matters. The patches of trauma light – of posttraumatic growth – coexisting alongside the darkness of trauma represent trauma survival anchors. Anchors of hope when so much feels hopeless and overwhelming, anchors of self-belief, points of connection and opportunity to acknowledge capacity as well as incapacity. In a nut shell positive options, options that trauma involved people may benefit from. A word of caution though. Trauma reaction is a whole, complex, multifaceted experience. This must be respected. The PTG term should not be bandied about in isolation and out of context, nor be excluded from trauma discussions; both extremes are damaging pathways.

Your challenge:

Investigate for yourself. Ask your friends, family and co-workers "Have you ever heard the term PTG or the words posttraumatic growth?"

My experience, and I've asked hundreds of people that question, is that it's difficult to find many who have heard about PTG, let alone find people educated and knowledgeable about PTG as a formally recognized trauma reaction. Ironically people readily identify with the concept that 'sometimes good things also come out of bad experiences'. Upon hearing about PTG, they usually 'get it' instantly, often asking the same question I did, "Why on earth don't we use these words?"

Image courtesy of Rhonda Abotomey

Recommendations:

This writing advocates that the words posttraumatic growth (PTG) should be promoted so they become mainstream knowledge and language, just like the words posttraumatic stress (PTS) are. It recommends greater levels of targeted conversation, research, policy and practice that specifically acknowledges and enables PTG.

How to make a difference

Powerful change starts with small seeds of initiative. From the un-helpful personal experience of PTG silence, and from saying, when I first heard the words, "I wish I had been told about PTG", my world changed again with further positive opportunity. I was invited into a research role by the University of Melbourne to partner with an interdisciplinary team in survivor initiated and informed PTG research. Marrying the lived experience of the interviewees with technical trauma expertise has advanced PTG understandings and produced PTG resources and presentations. Check out www.posttraumagrowth.net to see what individuals and workers involved with Black Saturday say about their own PTG experiences.

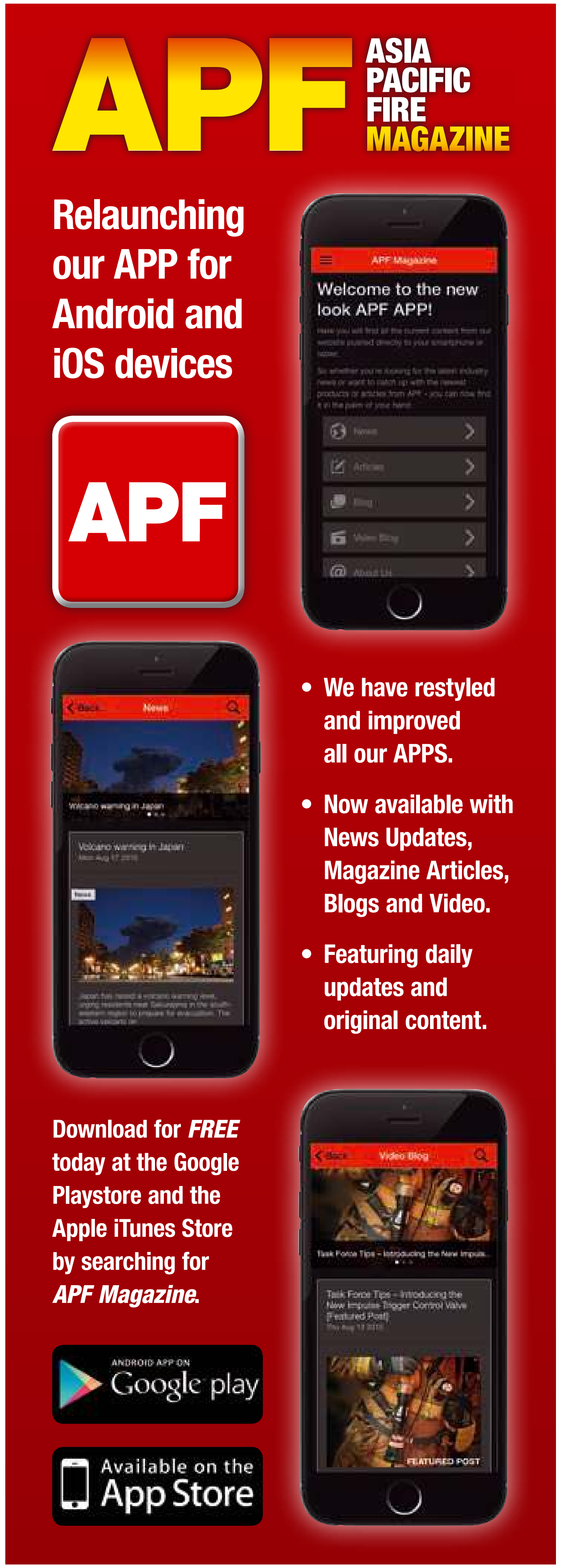
I have grown to be a passionate PTG advocate. You can too. So another challenge, a call to arms. You can make a difference to trauma recovery by advancing the PTG lens. It's easy. First and foremost, create change by simply having conversations and using the specific words of posttraumatic growth or PTG. Advocate for PTG terminology, promotion, research and education in your community, your workplaces, in your volunteer organizations and in emergency preparedness and recovery policy and practices. Speak up about what you want and need as PTG resources. Contribute to the evidence base.

It is time for:

- Courage and holistic discussion about the full range of possible trauma reactions, including growth.
- More conversation, education, policy and practices that purposefully integrate PTG.
- Reduced PTG stigma and isolation.
- Respecting decline while honouring growth from trauma

It is time for you to take PTG action!

For more information, go to www.posttraumagrowth.net


APF Magazine
Welcome to the new look APF APP!
News
Articles
Blog
Video Blog
About Us
Volcano warning in Japan
Video Blog
Task Force Tips – Introducing the New Impulse Trigger Control Valve [Featured Post]
FEATURED POST

APF ASIA PACIFIC FIRE MAGAZINE

Relaunching our APP for Android and iOS devices

APF

- We have restyled and improved all our APPS.
- Now available with News Updates, Magazine Articles, Blogs and Video.
- Featuring daily updates and original content.

Download for *FREE* today at the Google Playstore and the Apple iTunes Store by searching for *APF Magazine*.

ANDROID APP ON Google play

Available on the App Store

ADVERTISERS' INDEX

3M Technologies (S) Pte Ltd.	40
Advanced Electronics	4
AFAC 2017 Powered by Deutsche Messe	23
Apollo Fire Detectors Ltd.	83
Bauer Compressors Asia Pte. Ltd.	67
Bristol Uniforms Ltd.	61
Bullard Asia Pacific	71
China (Kunming) SE Asia & South Asia Fire Safety & Emergency Rescue Technology Expo	21
Coltraco Ultrasonics	6
Coltri Asia Pacific Co. Ltd.	67
Command Light	95
Cutters Edge	87
Dafo Fomtec	19
Dr. Sthamer Hamburg	33
Dynax Corporation	30
Eska Australia Pty Ltd.	63
Esri	17
Exova Warringtonfire Aus Pty Ltd.	13
FDIC 2017 / Pennwell Corp.	28-29
FFE	9
Fire Protection Association Australia	63
Firetrace International	47
Gradall SERV	75
Haes Systems	45
Hainsworth Technology	61
HD Fire Protect Pvt Ltd.	43
Heatseeker Technology & Design LLC	14
Holmatro Rescue Equipment	IBC
Intersec 2017	37
Janus Fire Systems	43
LHD Group Hong Kong Ltd.	52-53
MDM Publishing Ltd.	101
MSA – The Safety Company	57
PAB Akrapovic	58
PAC Fire Australia	54
Pacific Helmets (NZ) Ltd.	51
Performance Advantage Company	92
Safe Fleet	32
Saphire Complete Training Concepts	98
Simplex	80
Task Force Tips, Inc.	IFC/1
Teikoku I-Sen Co.	79
Tempest Technology Corporation	98
Tenmat Advanced Materials	23
Texas A & M Emergency Services Training Institute	95
TLX Technologies	45
Tyco Fire Protection Products	OBC
Waterax	91
Williams Fire & Hazard	35
Yone Corporation	27
Ziamatic Corporation	13
Ziegler	2

Come and see us at

FIRE & DISASTER ASIA 2016 SINGAPORE

28-30 September 2016 • Singapore

中国（昆明）东南亚·南亚
消防安全暨应急救援技术展览会

9-11 November 2016 • China

www.mdmpublishing.com

The 5th Generation Cutters

When it comes to the crunch, you can count on Holmatro cutters. Meet our Inclined Cutter CU 5050 i. Simply put its angle jaw in the right position for more ergonomic cutting of a car's roof or rocker channel. Or benefit from more room for tool movement when cutting pillars from the side. With a carrying handle that goes all-round this is easy: you can always use this cutter to your advantage, at all sides of the car.

You can count on us, for life

holmatro.com/en/cutters

Holmatro Rescue World

holmatro
mastering **power**

A CENTURY OF LEADERSHIP

A FUTURE OF INNOVATION

www.ansul.com

ASIA PACIFIC SALES OFFICES

Singapore ▪ Beijing ▪ Guangzhou ▪ Shanghai ▪ Wuhan ▪ Busan ▪ Seoul ▪ Taipei ▪ Hong Kong
Jakarta ▪ Bangalore ▪ Mumbai ▪ New Delhi ▪ Brisbane ▪ Melbourne ▪ Perth ▪ Sydney ▪ Christchurch

DISTRIBUTION
Everywhere

CONTACT US AT info.apac@tycofp.com